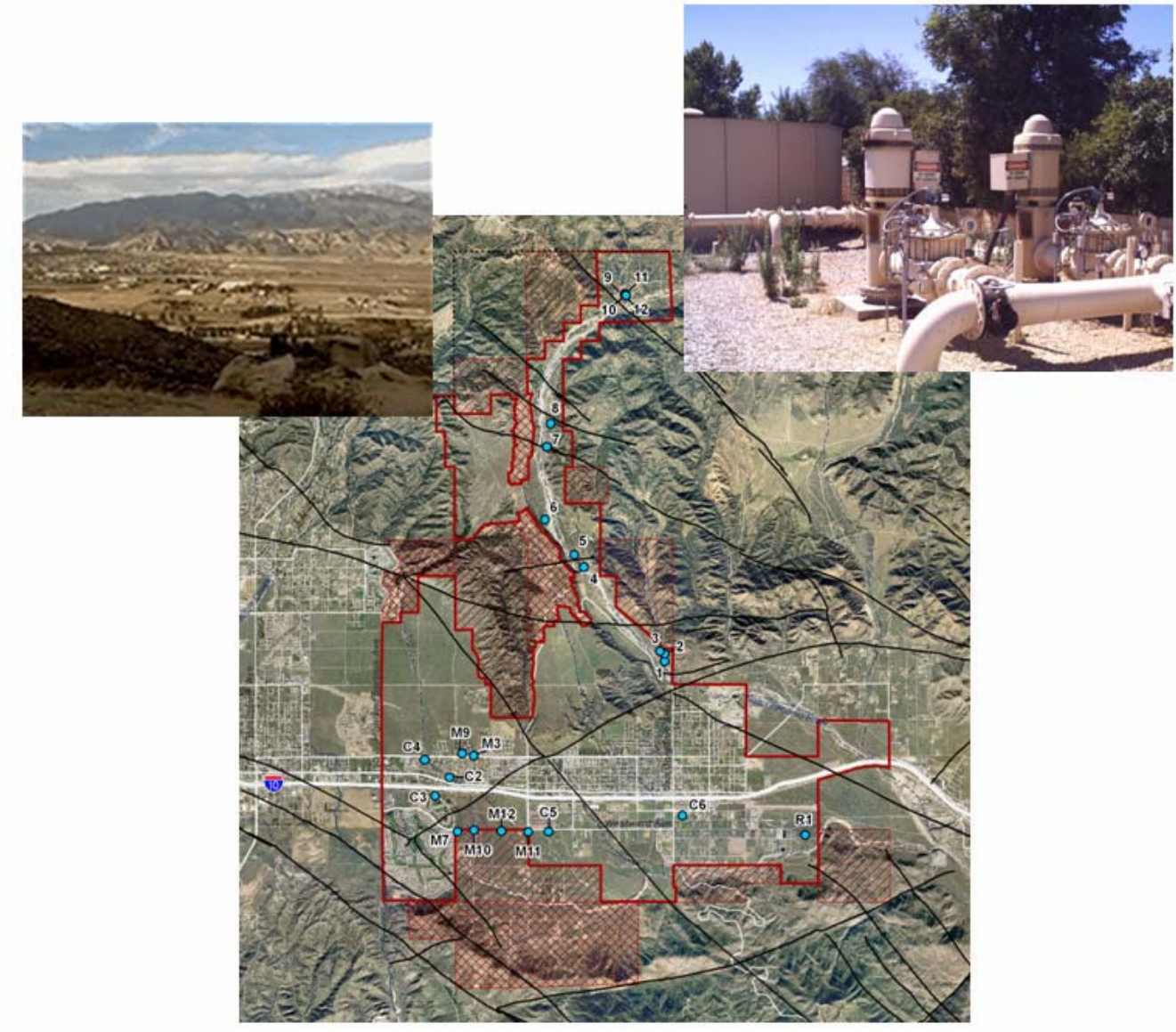
City of Banning

2005 Urban Water Management Plan



Prepared for:

Prepared by:

December 2005

WILDERMUTH™
ENVIRONMENTAL INC.

December 5, 2005

Paul Toor
Public Works Director/Assistant City Manager
City of Banning
Post Office Box 998
Banning, CA 92220

Subject: City of Banning 2005 Urban Water Management Plan (UWMP)

Dear Mr. Toor:

Transmitted herewith are 25 copies of the *City of Banning, 2005 Urban Water Management Plan*. It is our understanding that this draft will be submitted to the City Council on December 13th for adoption and to the California Department of Water Resources within 30 days of approval.

With the passage of Senate Bills (SB) 221 and 610 in 2001, the Urban Water Management Plans have become the foundational document for demonstrating sufficient water supplies for future development. Both SB 221 and 610 require substantial verification of water supplies that are based in part on proof of valid water rights, regulatory approvals required to convey or deliver sufficient water supply, and an adopted capital outlay program for financing the delivery of sufficient water supply. Ideally, the UWMP should be based on a series of current planning documents such as general plans, facility master plans and related environmental documents, and capital improvement plans.

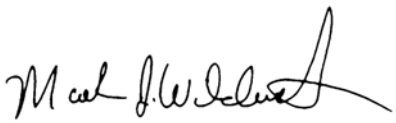
In order to satisfy the requirements of SB 221 and 610, WEI advises the City of Banning to implement the following to support its 2005 Urban Water Management Plan:

- Apply for State Water Project (SWP) water service from San Gorgonio Pass Water Agency (SGPWA) following the requirements set forth in SGPWA Ordinance No. 8. The point of delivery should include the same delivery point as the Beaumont Cherry Valley Water District. This will require an agreement with BCVWD to use the same facilities for diversion and recharge.
- Begin the process of purchasing additional SWP Table A water entitlement. This will entail entering into an agreement with the SGPWA where the SGPWA will use funds provided by the City to purchase Table A water and to earmark this water for the exclusive use by the City.
- The City should consider adjusting its connection fee for new development to include the transfer fee and present value of the SWP fixed cost so that the entire cost of this new water source is allocated to new development.
- Participate in the development of additional *wet-water* recharge capacity in the Beaumont Basin through either the Beaumont Watermaster or the San Timoteo Watershed Management Authority (STWMA). STWMA, acting on behalf of its member agencies, has included this effort in their FY 2005/2006 budget.
- Initiate the upgrade of Banning's Wastewater Treatment Plant to provide recycled water for irrigation.
- Revise the City's capital improvement plans to reflect the facilities and water source costs that are foundational to the water supply plan in the UWMP.
- Where applicable, CEQA analyses should be started for new water sources and the revised general plan in progress of adoption by the City.

Please contact us if you have any questions. Thank you for the opportunity to serve the City of Banning on this important and timely project. We look forward to serving the City in the future.

Very truly yours,

Wildermuth Environmental, Inc.



Mark J. Wildermuth, PE
President/Principal Engineer

Kristal Davis
Environmental Scientist

Encl.

LIST OF TABLES

LIST OF FIGURES

ACRONYM AND ABBREVIATIONS LIST	
µg/L	micrograms per liter
acre-ft/yr	acre feet per year
AWWA	American Water Works Association
BCVWD	Beaumont-Cherry Valley Water District
BOD	biological oxygen demand
BMP	Best Management Practice
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CII	Commercial/Industrial/Institutional
CIMIS	California Irrigation Management Information System
COOP	Cooperative Observer Program
CUWA	California Urban Water Agencies
CUWCC	California Urban Water Conservation Council
DHS	California Department of Health Services
DIR	demand-initiated regenerating
DWR	California Department of Water Resources
EDU	equivalent dwelling units
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ETo	evapotranspiration
fbgs	feet below ground surface
gpm	gallons per minute
HEWs	high-efficiency washing machines
IRWD	Irvine Ranch Water District
MCL	maximum contaminant level
mgd	million gallons per day
mg/L	milligrams per liter
MOU	Memorandum of Understanding

ACRONYM AND ABBREVIATIONS LIST	
NCDC	National Climatic Data Center
ND	not detected
RCFCD	Riverside County Flood Control District
RWQCB	Regional Water Quality Control Board – Santa Ana Region
SCAG	Southern California Association of Governments
SGPWA	San Gorgonio Pass Water Agency
SMWC	South Mesa Water Company
SOI	sphere of influence
STWMA	San Timoteo Watershed Management Authority
SWP	State Water Project
TDS	total dissolved solids
TSS	total suspended solids
ULFT	ultra low flush toilet
USGS	US Geological Survey
UWMPA	Urban Water Management Planning Act
UWMP	Urban Water Management Plan
WEI	Wildermuth Environmental, Inc.
WSCP	Water Shortage Contingency Plan
VOCs	volatile organic compounds
YVWD	Yucaipa Valley Water District

1. INTRODUCTION

1.1 Urban Water Management Planning Act

All urban water suppliers within the state of California are required to prepare urban water management plans. California Water Code Sections 10610 through 10657 detail the information that must be included in these plans as well as who must file them. This plan satisfies the requirements of the Urban Water Management Planning Act (UWMPA) of 1983 and the subsequent amendments to the Act. The text of the Act can be found in Appendix A. This report constitutes the 2005 update to the City of Banning's 1998 Urban Water Management Plan (UWMP).

According to the Act, an urban water supplier is defined as a supplier, either publicly or privately owned, that provides water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. Each urban water supplier is required to update its plan at least once every five years on or before December 31, in years ending in five and zero. This plan shall be adopted by the urban water supplier and submitted to the California Department of Water Resources (DWR).

Amendments to the UWMPA since the 1998 UWMP require greater analyses of management tools and options that will maximize resources and minimize the need to import water from other regions. An analysis of total projected water use compared to water supply sources over the next 20 years in five-year increments is required. Water quality, as it affects water management strategies and supply reliability, must be addressed in the same time increments. Information must be shown for a single dry year and multiple dry years. Additional amendments to the Act require detailed descriptions of groundwater basins and groundwater production if groundwater is an existing or planned source of water.

1.2 Law

> 10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

1.3 Public Participation

Notices announcing the preparation of the UWMP update were mailed with customer water bills starting in the month of February. The citizens of the City of Banning were encouraged to offer their comments during the preparation period of February 2005 through June 2005.

1.4 Public Hearing

A public hearing to present the UWMP was held in City Council Chambers, 99 E Ramsey Street, Banning, on September 7th, 2005. A summary of the public hearing is provided in Appendix B. A copy of the draft UWMP was also made available to the public on the City's website. Comments on the draft UWMP can be found in Appendix B.

1.5 Adoption Resolution

This updated plan is proposed to be adopted by the City Council on December 13th, 2005 and will be submitted to the California Department of Water Resources within 30 days of approval. This plan includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6. Urban Water Management Planning.

1.6 Agency Coordination

1.6.1 Law

> 10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

1.6.2 Cooperative Agreements with Local Agencies

The City of Banning, along with Beaumont-Cherry Valley Water District (BCVWD) and other major producers, developed a stipulated agreement with the San Timoteo Watershed Management Authority (STWMA) adjudicating pumping and storage rights in the Beaumont Basin. The City sits on a five member Watermaster Board that oversees the implementation of the groundwater management plan for the basin.

Given the shared use and interest in the Beaumont Basin, the City of Banning and BCVWD entered into a cooperative agreement in December 2003 to jointly own, operate, and construct three new production wells, to build a water treatment facility, and to interconnect their existing potable water distribution systems and recycled water systems.

The City of Banning is preparing an application to purchase State Water Project (SWP) water from the San Gorgonio Pass Water Agency (SGPWA). The rules and regulations for SGPWA water service are set forth in San Gorgonio Pass Water Agency Ordinance No. 8. To apply for water service, the City must provide the following information: the identity and legal capacity of the Applicant; the amount, rate, location, time, and manner of delivery of the water; a description of delivery facilities, capacity, and flow rates; and an environmental review and approval, as required under the California Environmental Quality Act (CEQA).

Table 1-1 summarizes the actions the City has taken to involve various agencies and the community in the planning process of the UWMP.

Table 1-1
Coordination and Public Involvement

	Received Copy of Draft	Commented on the Draft	Sent Notice of Public Hearing	Attended Public Meetings
SGPWA	X		X	X
BCVWD	X		X	
Beaumont Basin Watermaster	X		X	
STWMA	X		X	X
General Public	X	X	X	X
Various Developers	X		X	X

1.7 Supplier Service Area

1.7.1 Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic facts affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

1.7.2 Description

The City of Banning, shown in Figure 1-1, is located in the San Gorgonio Pass area of Riverside County, approximately 30 miles east of the cities of San Bernardino and Riverside. The westernmost part of the City of Banning's planning area is at the summit of the San Gorgonio Pass, which divides two major watersheds: the Santa Ana River Watershed to the west and the Salton Sea Watershed to the east. The majority of the City drains east into the Salton Sea Watershed. Elevations within the planning area rise to approximately 5,560 feet to the north and 2,880 feet to the south. The San Gorgonio River cuts through the southern portion of the planning area forming Banning Canyon.

117°0'0"W

34°0'0"N

San Bernardino County
Riverside County

Noble Creek

Beaumont Ave

Highland Springs Ave

San Gorgonio River

Wilson St

Westward Ave

10

9 11 10 12 8 7 6 5 4 3 2 1

M9 M3 C4 C2 C3 M12 C5 M7 M10 M11 C6 R1

Main Features

- Groundwater Production Well
- Banning City Boundary
- Banning Sphere of Influence
- Banning Planning Area

Other Features

Faults & Groundwater Divides

- Location Certain
- Location Approximate
- Location Concealed
- Location Uncertain
- Groundwater Divide

River

117°0'0"W

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0 1 2 3 4 Miles

0 2 4 6 KM

2005 Urban Water Management Plan

City of Banning

Groundwater Production Wells

Figure 1-1

The first recorded claims to the waters of Banning Canyon date back to 1875. The Banning Water Company was incorporated in 1884 to provide the delivery of domestic and irrigation water to various customers of the City of Banning. In 1913 the Banning Water Company entered into an agreement with the Consolidated Reservoir and Power Company for the delivery of 13.26 cfs of water from the headwaters of the Whitewater River. The Banning Heights Mutual Water Company and the City of Banning now receive a portion of that water. In that same year, the Banning Water Company began to operate as a public utility under the rules of the Railroad Commission (now the Public Utilities Commission). In 1957, an order was issued establishing rates for both general metered services and measured irrigation services. The City of Banning acquired the Banning Water Company in 1967. In 1997, the City purchased the Mountain Water Company. The Mountain Water Company supplied water to its customers from groundwater wells located in the City and in the unincorporated portion of the County of Riverside.

The City of Banning Public Works and Utilities Department provides domestic water services to all areas of the City except for a small section in the northern portion of the City, which is serviced by the Banning Heights Mutual Water Company. The City owns and operates wells, reservoirs, and a distribution line system to deliver domestic water within the Banning planning area. The City provides municipal water service to an area of approximately 23 square miles, including approximately 25,000 people, via about 10,500 metered connections.

The legal boundary of the City encompasses an area of 14,823 acres. An additional 5,436 acres are within the City's Sphere of Influence (SOI), and 3,296 acres are within the planning area. Figure 1-1 shows the City's boundary, SOI, and planning area.

1.7.3 Climate Characteristics

Table 1-2 summarizes climatic characteristics for the City of Banning. The evapotranspiration (ETo) values are the monthly and annual averages for 1985-2004 as measured at California Irrigation Management Information System (CIMIS) Station 44 at U.C. Riverside in Riverside, California. The next closest CIMIS station to the City of Banning is located in Cathedral City and it has comparable ETo values. ETo ranges from a high of 7.22 inches in the month of July to a low of 2.49 inches in January.

The average temperature values are for the period of 1948 to 2004 at the Beaumont 1E Station, National Climatic Data Center (NCDC) Cooperative Observer Program (COOP) Station 040609. As seen with ETo, the average maximum temperature of 95.6°F occurs in July and the average minimum temperature of 38.6°F occurs in January.

Precipitation data were measured at Riverside County Flood Control District (RCFCD) Station 12 in Banning. Monthly precipitation totals were available from January 1916 through July 2004, with the exceptions of the years 1991-1993 and 2000-2001. Average monthly precipitation ranges from a high of 3.24 inches in March to a low of 0.07 inches in July.

Table 1-2
Climate Characteristics for the City of Banning

	Average ETo (inches)	Average Min Temperature (°F)	Average Max Temperature (°F)	Average Total Precipitation (inches)
January	2.49	38.6	60.5	2.59
February	2.91	39.1	63.6	2.93
March	4.16	40.0	66.2	3.24
April	5.27	42.8	72.5	2.82
May	5.94	47.7	78.8	1.41
June	6.56	52.5	88.0	0.50
July	7.22	58.4	95.6	0.07
August	6.92	58.9	95.5	0.17
September	5.35	55.8	90.6	0.25
October	4.05	49.3	80.7	0.48
November	2.94	43.1	69.4	0.69
December	2.56	39.2	62.0	1.49
Annual	56.37	47.1	77.0	16.65

Table 1-3 shows annual precipitation totals for 1916-2004. For the years 1991-1993 and 2000-2001 data from RCFCD Beaumont Station 13 are reported. Precipitation values measured at the Beaumont station are similar to values measured at the Banning station and were reported to show approximate rainfall for the years where data were not available at the Banning station. As seen in Table 1-3, the driest year between 1916 and 2004 occurred in 2002, which experienced a total rainfall of 3.4 inches.

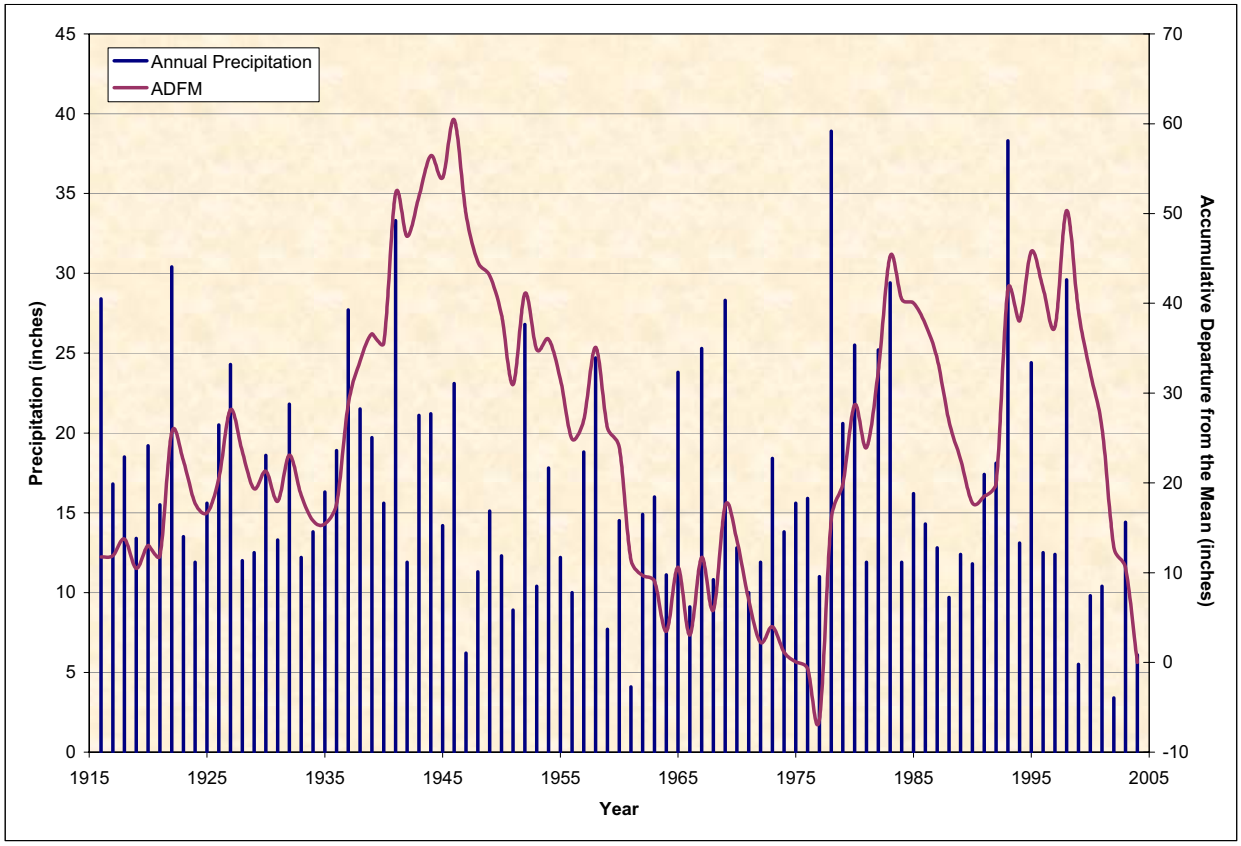
Annual precipitation is presented graphically in Figure 1-2 along with the accumulated departure from the mean (ADFM). The ADFM plot is useful in characterizing the occurrence and magnitude of wet and dry climatic periods. Negatively sloping segments (trending down to the right) in ADFM curves indicate dry periods; and positively sloping segments (trending up to the right) indicate wet periods. The City of Banning has been experiencing a dry period since 1999 as shown by the sharp negative slope of the ADFM curve.

Table 1-3
City of Banning Annual Precipitation

Calendar Year	Precipitation (inches)	Calendar Year	Precipitation (inches)	Calendar Year	Precipitation (inches)
1916	28.4	1946	23.1	1976	15.9
1917	16.8	1947	6.2	1977	11.0
1918	18.5	1948	11.3	1978	38.9
1919	13.4	1949	15.1	1979	20.6
1920	19.2	1950	12.3	1980	25.5
1921	15.5	1951	8.9	1981	11.9
1922	30.4	1952	26.8	1982	25.2
1923	13.5	1953	10.4	1983	29.4
1924	11.9	1954	17.8	1984	11.9
1925	15.6	1955	12.2	1985	16.2
1926	20.5	1956	10	1986	14.3
1927	24.3	1957	18.8	1987	12.8
1928	12	1958	24.7	1988	9.7
1929	12.5	1959	7.7	1989	12.4
1930	18.6	1960	14.5	1990	11.8
1931	13.3	1961	4.1	1991	17.4[1]
1932	21.8	1962	14.9	1992	18.1[1]
1933	12.2	1963	16	1993	38.3[1]
1934	13.8	1964	11.1	1994	13.1
1935	16.3	1965	23.8	1995	24.4
1936	18.9	1966	9.1	1996	12.5
1937	27.7	1967	25.3	1997	12.4
1938	21.5	1968	10.8	1998	29.6
1939	19.7	1969	28.3	1999	5.5
1940	15.6	1970	12.8	2000	9.8[1]
1941	33.3	1971	10	2001	10.4[1]
1942	11.9	1972	11.9	2002	3.4
1943	21.1	1973	18.4	2003	14.4
1944	21.2	1974	13.8	2004	6.1[2]
1945	14.2	1975	15.6		

[1]Data from RCFCD Beaumont Station 13
[2]Precipitation through July, 2004

Figure 1-2
City of Banning Annual Precipitation from 1916-2004



1.7.4 Demographic Characteristics

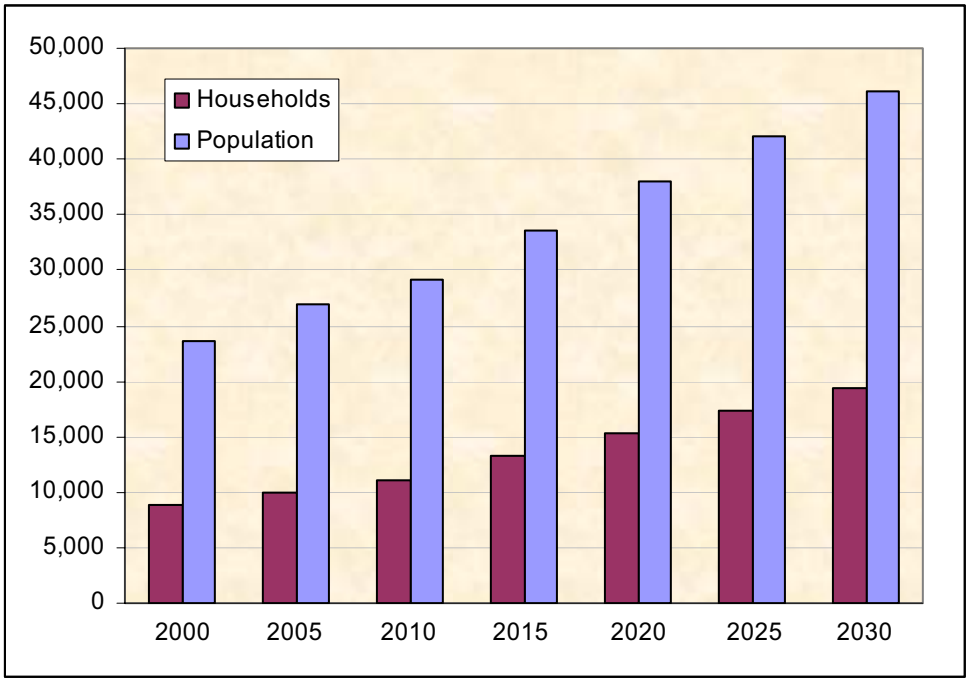
1.7.4.1 Population Density

Table 1-4 and Figure 1-3 show the forecasted population of the City of Banning based on the Southern California Association of Governments (SCAG) 2004 Regional Transportation Plan Growth Forecast. Over the next 25 years, the population of the City of Banning is estimated to grow by 20,000 people at an average growth of 770 people per year.

Table 1-4
Population, Household, and EDU Projections

	2000	2005	2010	2015	2020	2025	2030
Population	23,622	26,917	29,213	33,623	37,972	42,140	46,140
Households	8,943	9,962	11,140	13,211	15,305	17,371	19,418
People/EDU	2.64	2.70	2.62	2.55	2.48	2.43	2.38

Figure 1-3
Population and Household Growth Projection



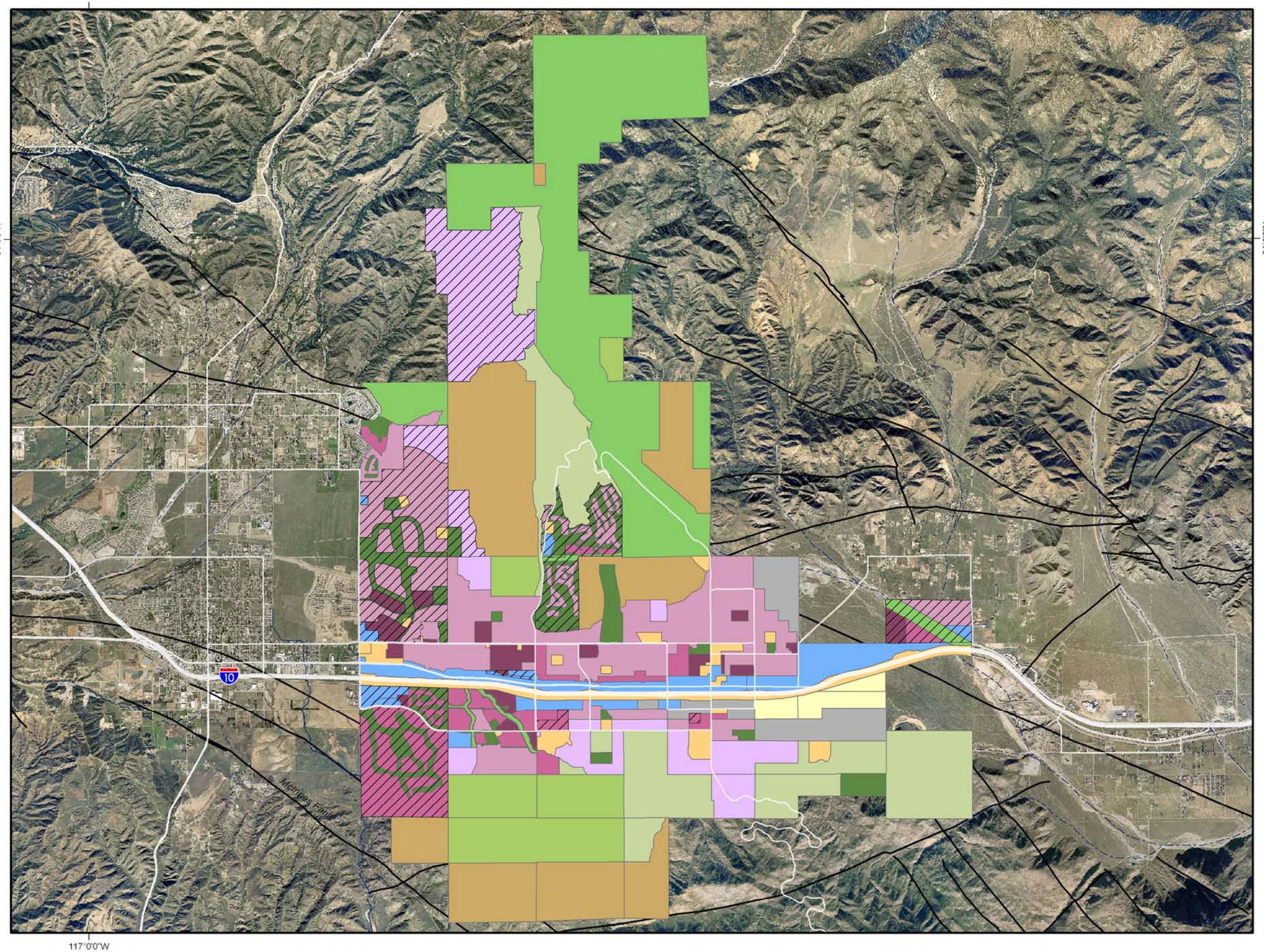
1.7.4.2 Land Development

The City of Banning's future landuse primarily consists of two types of developments: master planned communities and the continuation of infill development. Existing and proposed master planned communities, including the Sun Lakes project, the Loma Linda property Specific Plan, the Deutsch Specific Plan, the Black Bench Ranch, and the Sunset Crossroads Specific Plan, include specific landuse designations (i.e. commercial, public facilities, open space, etc.) and have been incorporated into the City's landuse designations at buildout. Table 1-5 lists the City's development projects and associated equivalent dwelling units (EDUs). The time frame for completion of these development projects is difficult to estimate as final completion varies based on future economic conditions.

The greatest increases in acreage per landuse are in the ranch/agricultural and rural residential categories. The City of Banning is committed to preserving its hillsides. Within these categories are hillside designations, which allow for the development of flat areas at a greater density when hillside areas are preserved. Table 1-6 depicts the landuse buildout summary as described in the City's General Plan. These landuses are shown spatially in Figure 1-4.

117°0'0"W

34°0'0"N



34°0'0"N

117°0'0"W

Main Features

- Rural Residential
- Very Low Density Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Airport
- Public Facilities
- Hillside Preservation
- Parks
- Open Space
- Ranch/Agricultural
- Specific Plan Areas

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0 1 2 3 4 Miles

0 2 4 6 KM

BANNING CALIFORNIA ESTABLISHED 1913

2005 Urban Water Management Plan

City of Banning

Landuse at Buildout

Figure 1-4

Table 1-5
City of Banning Development Projects

Project	Status	Number of EDUs
Sunset Crossroads	In Review Process	2,448
Banning Bench/Loma Linda Property	EIR and Specific Plan Approved	944
Deutsch Property	Specific Plan, Development Agreement, and EIR Approved; Tract Maps and Architectural Review Needed	5,400
Black Bench Ranch	Development Agreement Adopted; Specific Plan, EIR, Tract Maps and Architectural Review Needed	1,500
Sun Lakes Country Club - South	Built	2,960
Sun Lakes Country Club - North	Built	368
Wilson Homes 1	Built	107
Wilson Homes 2	Under Construction	121
Evergreen Lane	Under Construction	24
Brickman	No Activity Recorded	42
James Ford	Approved	21
Rocehell & Oberg	No Activity Recorded - will expire 6/8/06	10
Century Crowell-Fair Oaks	Under Construction	70
Action Surveys	Approved	53
LTV Builders	Approved	38
Madrid	In Review/Approval Process	44
Roa	Approved	10
HLCD	Approved	24
Stallion Estates	Approved	213
Fiesta Homes	Under Construction	43
Banning Family Apartments	Built	81
Pepper Tree Apartments	Built	81
Charter Management/Galleher	Approved	9
Silver Oaks	Under Construction	152
Century Crowell	Under Construction	17
Century Crowell	Approved	18
Century Crowell	Approved	33
Fiesta Development	Approved	302
Careage Development	Built	72
Tahiti Group	In Review/Approval Process	30
Carri Construction	Approved	13
C.W. Tefft	In Review/Approval Process	484
Total		**15,732**

Table 1-6
City of Banning General Plan Landuses at Buildout

Landuse Designation	City limits		SOI		Planning Area		Total		
	Acres Developed	Acres Vacant	Acres Developed	Acres Vacant	Acres Developed	Acres Vacant	Acres Developed	Acres Vacant	Total Acres
Single & Multi-Family Residential									
Rural Residential – Hillside Preservation						262.8		262.8	262.8
Rural Residential	123.2	812.5	8.5	901.1	199.5	646.5	331.2	2,360.1	2,691.2
Very Low Density Residential	231.2	1,707.4	21.6	198.8			252.8	1,906.2	2,159
Low Density Residential	1,326.1	1,839.4		142.3	2.4	129.7	1,328.5	2,111.4	3,439.9
Medium Density Residential	677.7	433.7		40.6	0.2	29.5	677.9	503.8	1,181.7
High Density Residential	220	262.9	0.1	9.5			220.1	272.4	492.5
Subtotal	2,578.2	5,055.9	30.2	1,292.3	202.1	1,068.5	2,810.5	7,416.7	10,227.2
Commercial									
General Commercial	288.1	467.6	0.2	29.7			288.3	497.3	785.6
Highway Serving Commercial	103.7	7.3					103.7	7.3	111
Downtown Commercial	91.8	11.3					91.8	11.3	103.1
Professional Office	23	18.9					23	18.9	41.9
Business Park	1	16.3					1	16.3	17.3
Subtotal	507.6	521.4	0.2	29.7			507.8	551.1	1,058.9
Industrial									
Industrial	152.6	278.3					152.6	278.3	430.9
Airport Industrial	41.6	94.2					41.6	94.2	135.8
Industrial - Mineral Resources	188.5	27.7					188.5	27.7	216.2
Subtotal	382.7	400.2					382.7	400.2	782.9
Landscape/Recycled Water Users									
Open Space- Hillside Preservation					0.2	647.1	0.2	647.1	647.3
Open Space - Park	320.3	836.5		26.3	29.8	15.8	350.1	878.6	1,228.7
Open Space - Resources	122.3	2,565.9	25	1,598.7	1.2	230	148.5	4,394.6	4,543.1
Subtotal	442.6	3,402.4	25	1625	31.2	892.9	498.8	5,920.3	6,419.1
Agricultural									
Ranch/Agricultural		77.7	74	724.7	29.6	631.6	103.6	1434	1,537.6
Ranch/Agricultural – Hillside Preservation	121.8	351.5	16.8	1,615.6	18.7	421.1	157.3	2,388.2	2,545.5
Subtotal	121.8	429.2	90.8	2,340.3	48.3	1,052.7	260.9	3,822.2	4,083.1
Other									
Public Facilities	680.8	259.3		2.7			680.8	262	942.8
Subtotal	680.8	259.3		2.7			680.8	262	942.8
Total	**4,714**	**10,068**	**146**	**5,290**	**282**	**3,014**	**5,142**	**18,373**	**23,514**

2. WATER SOURCES

2.1 Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments as described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

1) A copy of any groundwater management plan adopted by the urban water supplier, including any specific authorization for groundwater management.

2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

2.2 Water Supply Sources

2.2.1 Current and Planned Water Supplies

The City of Banning's existing and planned water supply sources, in acre-ft/yr, are shown in Table 2-1 and Figure 2-1. With the exception of the Beaumont storage unit, groundwater supplies for each storage unit reflect the middle value within the range of the maximum perennial yield, as established in the *Determination of Maximum Perennial Yield for the City of Banning* (Geoscience, 2003).

In February 2004 a stipulated judgment (Judgment) adjudicating the groundwater pumping and storage rights in the Beaumont Basin was approved by the Superior Court of California. A copy of the Judgment can be found in Appendix C. The Judgment established pumping rights among the two classes of pumpers: overlying and appropriate pumpers. The overlying pumpers were assigned fixed rights with some flexibility to vary their maximum use during any five-year period. The safe yield established in the Judgment is 8,650 acre-ft/yr. The total of the overlying producers' rights is equal to the safe yield. Collectively, the overlying pumpers produce substantially less than their aggregate rights. Appropriator's rights are stated as the percentage or fraction of water in the safe yield that is not used by the overlying pumpers. The Judgment provides for the orderly transition of landuse and associated water uses through detailed provisions that require the assignment of rights from an overlying pumper to an appropriator when the appropriator provides service to the lands of the overlying pumper. After this occurs, the City of Banning, an appropriator, will have rights to a minimum of 400 acre-ft/yr.

Furthermore, the Judgment declares that there is a temporary surplus of water of 160,000 acre-ft in the basin, of which the City has the right to pump 5,910 acre-ft/yr for the next ten years. Pursuant to the Judgment, the City is allowed to pump sufficient water from the Beaumont Basin in order to meet its water demand. Should this amount exceed the City's rights, the Beaumont Basin Watermaster has an obligation to replenish the overproduction.

Recycled water supplies are shown in Table 2-1 as equal to projected irrigation demand. Recycled water production will actually exceed demand and may be used in other beneficial ways. This will be further discussed in Section 8.

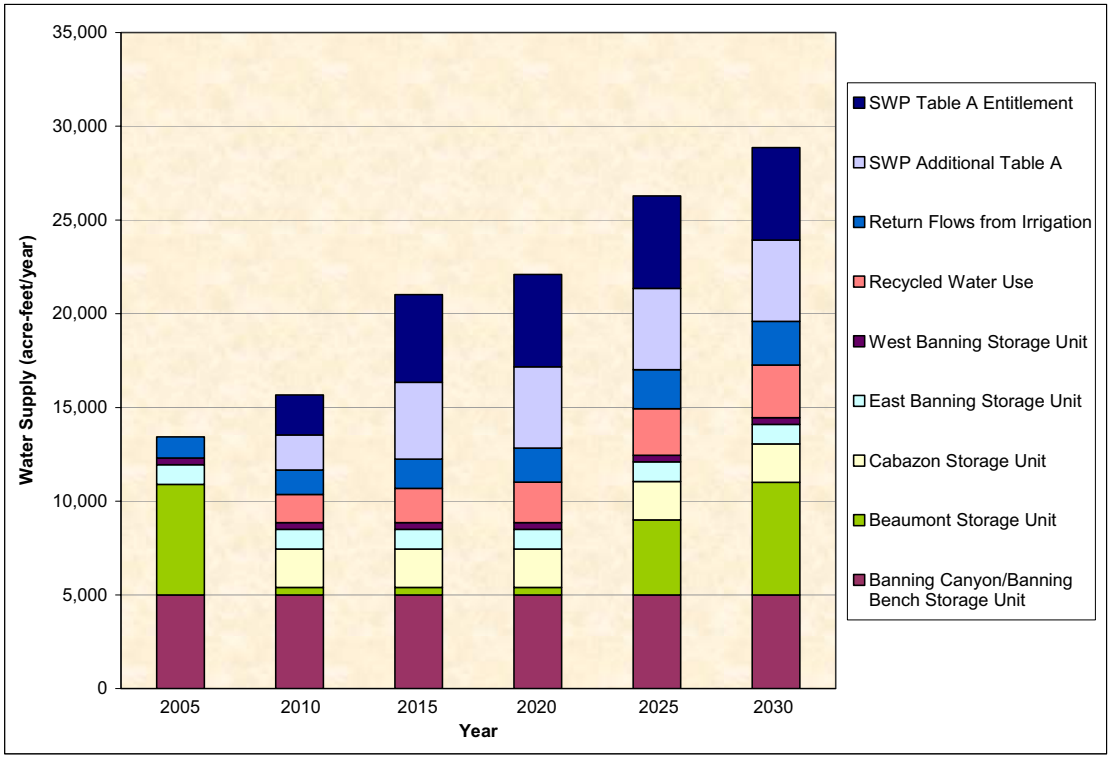
Water applied for irrigation typically exceeds the evapotranspiration requirements of the plant. Water that isn't utilized by the plants will percolate to the groundwater and be available for future use. This volume of water is known as return flow. In Table 2-1 return flows from irrigation were calculated from current and projected demands based on population growth. A consumptive use factor of 0.75 has been used in groundwater quality modeling in the Chino Basin. Using the same consumptive use factor, return flows are equal to 25% of the total amount of water used for irrigation plus the portion of residential water used for outdoor irrigation, which is 50% in the Banning area. Any irrigation occurring in the industrial, commercial, or public sector was not included in the return flow calculations.

State Water Project water is projected to be available to the City starting in 2007. The City plans to purchase 6,574 acre-ft/yr of SWP water from SGPWA and an additional 5,780 acre-ft/yr from DWR or other entities in Central and/or Northern California. The variable reliability of SWP water was accounted for in determining projected supplies. The amount of SWP water purchased will increase as demand increases.

Table 2-1
Current and Projected Water Supplies
(acre-ft/yr)

Water Supply Source	2005	2010	2015	2020	2025	2030
Banning Canyon/Banning Bench Storage Unit	5,000	5,000	5,000	5,000	5,000	5,000
Beaumont Storage Unit	5,900	400	400	400	4,000	6,000
Cabazon Storage Unit	0	2,050	2,050	2,050	2,050	2,050
East Banning Storage Unit	1,050	1,050	1,050	1,050	1,050	1,050
West Banning Storage Unit	350	350	350	350	350	350
Recycled Water Use	0	1,504	1,832	2,160	2,488	2,816
Return Flows from Irrigation	1,128	1,309	1,564	1,822	2,077	2,330
SWP Table A Entitlement	0	2,129	4,667	4,931	4,931	4,931
SWP Additional Table A	0	1,871	4,104	4,335	4,335	4,335
Total	**13,428**	**15,663**	**21,017**	**22,098**	**26,281**	**28,863**

Figure 2-1
Current and Projected Water Supplies



2.2.2 Groundwater

2.2.2.1 Description

The City of Banning is underlain by the San Gorgonio Pass and Banning Canyon Groundwater Basins. Within the City boundary, the San Gorgonio Pass Basin is subdivided into a series of storage units: the Banning Bench, Banning, Beaumont, and Cabazon storage units (Bloyd, 1969). Based on Bloyd's fault descriptions, Engineering Associates has described the Banning Canyon Groundwater Basin as consisting of three storage units (Engineering Associates, 1978): the Upper, Middle, and Lower Banning Canyon storage units. Figure 2-2 shows the location of these storage units.

The groundwater basins are naturally recharged through the percolation of runoff, direct precipitation, subsurface inflow, and artificial recharge. The Banning Canyon area receives water from the percolation of canyon flows through the gravelly soils of the canyon bottom. The San Gorgonio River running southerly through the Banning Canyon provides intake areas for distributing water to spreading ditches that interconnect with spreading ponds to enhance percolation. The San Gorgonio Basin is recharged naturally with runoff from the adjacent San Jacinto and San Bernardino Mountains.

Upper Banning Canyon Storage Unit

The Upper Banning Canyon storage unit is located in the northernmost portion of the City and is partially located in the County of San Bernardino. Static water levels measured in 2004 range from 14 to 80 feet below ground surface (fbgs). The City currently operates 4 wells with a combined design capacity of 3,800 gpm in this area. The total maximum extraction from this storage unit is 6,130 acre-ft/yr.

Middle Banning Canyon Storage Unit

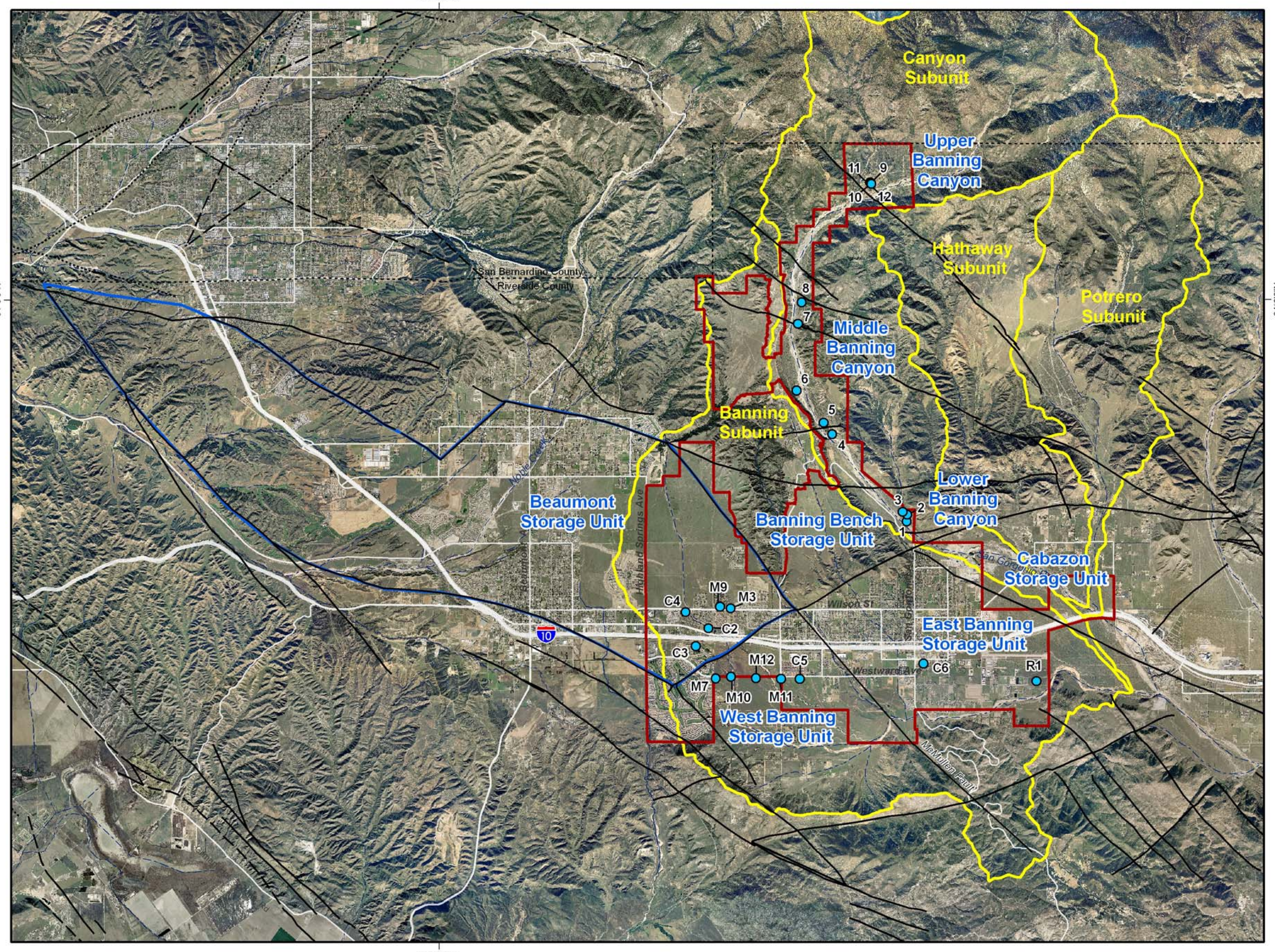
The Middle Banning Canyon storage unit is located south of the Upper Banning Canyon storage unit. Typically, groundwater levels throughout the Middle Banning Canyon storage unit respond rapidly to precipitation and recharge because of the high permeability and limited groundwater storage. Bedrock in this portion of the canyon is located approximately 200 fbgs. Recently measured groundwater depths range from 20 to 117 fbgs. The City currently operates 4 wells with a combined design capacity of 7,000 gpm in this area. The total maximum extraction from this storage unit is 11,290 acre-ft/yr.

Banning Bench Storage Unit

The Banning Bench storage unit (also known as the Lower Banning Canyon Basin) is the southernmost storage unit in Banning Canyon. This storage unit is located north of the City, in an area of alluvial fill that is distinctly higher than the San Gorgonio Pass area, and against the rugged foothills of the San Bernardino Mountains. The Banning Bench is approximately 1.5 miles wide and 160 feet above the stream channel at the mouth of the San Gorgonio River Canyon. Groundwater from this storage unit tends to flow south into the Banning and Beaumont storage units. Depth to groundwater within this storage unit, as measured in 2004, ranges from 40 to 67 fbgs. The City operates 3 wells with a combined design capacity of 3,500 gpm in this storage unit. Total maximum extraction from this storage unit is 5,650 acre-ft/yr.

Banning Storage Unit

The Banning storage unit is located south of the Banning Bench storage unit and can be further divided into East and West storage units based on surface water drainage (Geoscience, 2003). The East Banning



Main Features

Groundwater Production Well

City Of Banning Boundary

Storage Unit defined by fault system as described by Bloyd

Subunits described by Geoscience (2003)

Other Features

Faults & Groundwater Divides

Location Certain

Location Approximate

Location Concealed

Location Uncertain

Groundwater Divide

River

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0 1 2 3 4 Miles
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Groundwater Storage Units

City of Banning Groundwater Supply

Figure 2-2

storage unit is located near the City's downtown area, east of the McMullen Fault. This storage unit encompasses approximately 4.4 square miles and serves the area at the base of the Banning Bench and the southern portion of the City. In 2004, depth to groundwater within this storage unit was 380 fbgs. The City operates 1 well in the East Banning storage unit that has a design capacity of 1,000 gpm. Total maximum extraction from this storage unit is 1,610 acre-ft/yr. The West Banning storage unit is located west of the East Banning storage unit, south of the Banning Bench storage unit, and west of the City's downtown area and McMullen Fault. This storage unit encompasses approximately 7.6 square miles and serves the area at the base of the Banning Bench and the southwestern portion of the City. In 2004, depth to groundwater within this storage unit ranged from 300 to 388 fbgs. The City operates 5 wells in the West Banning storage unit with a combined design capacity of 4,450 gpm. Total maximum extraction from this storage unit is 7,170 acre-ft/yr.

Beaumont Storage Unit

The Beaumont storage unit covers approximately 28 square miles and is bounded on the north by the Banning and Cherry Valley faults and on the south, east, and west by postulated faults of the Banning Fault System. A portion of the Beaumont Storage Unit is located within Banning City limits; however, this storage unit is primarily located within the City of Beaumont. Both BCVWD and the City of Banning pump water from this storage unit. In 2004, depth to groundwater within this storage unit ranged from 355 to 418 fbgs. Pursuant to the Beaumont Basin Judgment, the City has the right to pump 5,910 acre feet annually from this storage unit for the next ten years; at which time, it will decrease to a minimum of 400 acre-ft/yr. Nonetheless, the City has the right to produce water at a level that meets its water demand and the Beaumont Basin Watermaster is obligated to replenish any overproduction that occurs. The City operates 5 wells in the Beaumont storage unit with a combined capacity of 8,700 gpm. Total maximum extraction from this storage unit is 14,030 acre-ft/yr.

Cabazon Storage Unit

The Cabazon storage unit encompasses approximately 11 square miles. The Cabazon storage unit is located near the eastern boundary of the City, southeast of the Banning Bench storage unit and northeast of the Banning storage unit. The City does not currently operate any wells in the Cabazon storage unit. Other groundwater users in the Cabazon storage unit, Mission Springs Water District, Desert Hills Premium Outlets, and Cabazon Water District, have produced approximately 1,200 acre-ft/yr of groundwater over the last five years.

2.2.2.2 Existing Sources

The City currently operates and maintains 22 potable groundwater production wells. Half of these wells are located in Banning Canyon and the remaining wells are located in the East and West Banning storage units and the Beaumont storage unit.

Table 2-2 shows a summary of the City's wells and their current capacities by storage unit (Montgomery Watson Harza, 2002; George Thacker, personal communication, March 17, 2005). The 22 wells have a total design capacity of approximately 28,450 gpm. During dry years, the capacity of the Canyon and Banning Bench wells decrease in response to decreased precipitation and subsequent recharge. In 2002, a recent dry year, the total capacity of the wells was estimated to be 18,950 gpm.

Table 2-2
Well Capacities by Storage Unit

Wells by Storage Unit	Well Design Capacity		Dry Year Capacity	
	gpm	acre-ft/yr	gpm	acre-ft/yr
Upper Banning Canyon	3,800	6,130	1,600	2,580
Middle Banning Canyon	7,000	11,290	1,600	2,580
Banning Bench	3,500	5,650	1,600	2,580
East Banning	1,000	1,610	1,000	1,610
West Banning	4,450	7,180	4,450	7,180
Beaumont	8,700	14,030	8,700	14,030
Total Capacity	**28,450**	**45,890**	**18,950**	**30,560**

Table 2-3 shows the annual production per well in each storage unit for 1990 through 2004. Due to system pressure requirements, more water is extracted from the Banning Canyon wells than is needed to meet demand. The excess water is extracted from wells higher in the canyon and returned to the basin via recharge basins at Wells Nos. 4 and 7. This volume of water is shown as accounted for water in Table 2-3.

Table 2-3
Annual Well Production for 1990-2004

	Annual Water Production (acre-ft/yr)														
Wells	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Upper Banning Canyon															
9	210	3	33	41	3	171	0	0	0	0	3	564	588	0	0
10	413	0	0	0	4	0	1	0	0	13	615	393	796	203	815
11	17	0	0	0	22	39	0	0	0	0	116	94	0	76	561
12	242	0	19	0	66	78	0	0	0	0	396	671	0	0	0
Middle Banning Canyon															
4	305	36	1,385	1,136	11	15	0	281	467	728	396	0	0	0	0
5	705	1,517	365	1,046	907	1,340	1,173	1,465	1,219	1,185	681	1,406	337	479	164
6	34	1	0	6	3	0	0	0	0	0	0	0	0	0	0
7	750	1,774	2,218	2,075	822	5	962	684	2,061	1,187	749	589	439	1,555	1,031
8	1,633	812	246	470	2,015	3,356	2,235	2,282	1,174	1,877	1,879	1,730	778	55	719
Banning Bench															
1	477	331	1,085	744	1,097	816	1,619	1,167	796	387	0	0	639	865	1,244
2	24	54	67	288	280	291	312	247	245	472	71	25	84	12	0
3	218	23	114	213	280	575	1,748	1,650	1,076	1,089	624	339	10	0	0
Accounted for Water	**280**	**933**	**1,017**	**1,097**	**342**	**153**	**120**	**124**	**353**	**110**	**153**	**99**	**63**	**65**	**466**
East Banning															
C6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	323
West Banning															
C5	0	0	406	445	118	225	115	135	180	331	586	839	1,103	869	625
M7	0	0	0	0	0	0	0	0	10	0	0	0	303	344	164
M10	0	0	0	0	0	0	0	0	29	0	0	0	0	432	232
M11	0	0	0	0	0	0	0	0	0	0	0	0	0	130	228
M12	0	0	0	0	0	0	0	0	0	0	0	0	0	949	696
Beaumont															
C2	415	1,152	645	407	356	3	4	0	0	91	748	1,007	1,213	1,136	711
C3	718	1,721	831	822	163	89	166	20	166	726	1,108	1,113	1,322	1,017	1,031
C4	0	0	322	514	1,253	850	330	726	1,049	1,263	1,548	1,254	1,700	980	1,145
M3	0	0	0	0	0	0	0	0	47	0	0	0	3	525	170
M9	0	0	0	0	0	0	0	0	8	0	0	0	402	425	0
Imported from BCVWD													36	0	558
Total Annual Production	**5,881**	**6,491**	**6,719**	**7,110**	**7,058**	**7,700**	**8,545**	**8,533**	**8,174**	**9,239**	**9,367**	**9,925**	**9,690**	**9,987**	**9,951**

Source: George Thacker, City of Banning, March 17, 2005.

The amount of groundwater in storage within the City of Banning area, including the Beaumont storage unit, which falls within the City limits, is estimated to be between 1.4 and 2.6 million acre-feet (Geoscience, 2003). The recommended safe yields for the storage units, as calculated in the *Determination of Maximum Perennial Yield for the City of Banning* (Geoscience, 2003), are presented in Table 2-4. In the Geoscience report, maximum perennial yield was determined by subunit, not storage unit; however, the subunits are comparable to the storage units described above with the exception of the Cabazon storage unit, which lies partially within the southern portions of the Hathaway and Potrero subunits, and the Banning Bench storage unit whose production wells lie in the Banning Canyon subunit. These subunits are shown in Figure 2-2.

Table 2-4
Safe Yield of Groundwater Sources

Groundwater Sources	Recommended Range of Maximum Perennial Yield (acre-ft/yr)
Banning Canyon/Banning Bench	4,000 - 6,000
West Banning Storage Unit	300 - 400
East Banning Storage Unit	900 - 1,200[1]
Beaumont Storage Unit	400 - 6,300[2]
Hathaway	600 - 1,000
Potrero	700 - 1,800
Grand Total	**6,900 - 16,700**

[1]Values do not include wastewater recharge that can be recovered for future potable and non-potable uses
[2]City of Banning's allocation of operating yield per Beaumont Basin Judgment

Groundwater management is a local responsibility and, as such, the City of Banning plans to manage their groundwater sources within the recommended range of the maximum perennial yield. In *California's Groundwater Bulletin 118 – Update 2003* (DWR, 2003), groundwater mining is presented as part of an overall management strategy that some local agencies may practice. Groundwater mining is the deliberate extraction of groundwater in excess of recharge in a basin. Under this groundwater management approach, the City may choose to mine groundwater when the need arises.

2.2.2.3 Planned Sources

The City of Banning plans to drill new wells as the need arises. The City entered into a cooperative agreement with BCVWD to jointly construct and operate three new production wells and construct a new treatment plant for SWP water. Funding for this project and the construction of a fourth well has been accounted for in the water rate schedule of June 2003 (Banning City Code Section 31-3) and the new water connection fee adopted by the City in December 2004 (Banning City Code Section 31-4). A copy of these City Codes can be found in Appendix D.

2.2.3 Surface Water

2.2.3.1 Existing Sources

Starting in 1913, surface water from the Whitewater River was diverted into the Banning Canyon storage unit. Since 1961, an average of 1,500 acre-ft/yr was diverted into Banning Canyon. The water flowed along a concrete lined conveyance system and through two hydroelectric power plants. Below the second powerhouse, Banning Heights Mutual Water Company extracted approximately 1,000 acre-ft/yr. The remaining water flowed into the San Gorgonio River, where it recharged the Banning Canyon storage unit. Presently, the flume that carried the diverted water is non-operable due to flood damage. The diverted water now flows into a tributary to the San Gorgonio River, where a portion of that water is removed by Banning Heights Water Company.

2.2.3.2 Planned Sources

The City of Banning does not currently have any plans for developing additional surface water supplies.

2.2.4 Recycled Water

2.2.4.1 Existing Sources

The City of Banning Wastewater Treatment Plant, located in the southeast section of the City, has the capacity to treat 3.6 mgd of wastewater to secondary standards. The average flow received by the plant is 2.3 to 2.4 mgd. The headworks, completed in 1999, was designed for an ultimate capacity of 7.8 mgd. The current treatment process includes screening, grit removal, primary clarification, trickling filters, and secondary clarifiers. Anaerobic digesters and sludge drying beds are used for sludge stabilization and dewatering. Treated effluent is discharged to percolation ponds and subsequently recharges the East Banning storage unit.

2.2.4.2 Planned Sources

The City is developing a program to substitute recycled water for existing potable water demand used for irrigation. A design has been completed on an irrigation pipeline that would allow the City to deliver recycled water to irrigation customers. Phase I of the City's proposed recycled water system would make 3.6 mgd (4,033 acre-ft/yr) available for irrigation purposes. In addition, Phase II of the City's proposed recycling water system would make an additional 3.0 mgd (3,361 acre-ft/yr) available, for a total of 6.6 mgd (7,394 acre-ft/yr).

The City has recently updated its Irrigation Feasibility Study to determine the current cost of implementing Phase I and Phase II of the proposed recycled water system. Water rates have been increased and will continue to incrementally increase until 2006, in part, to finance the proposed recycled water system (Banning City Code Section 31-3). In December 2004, City Ordinance No. 1320 approved a water connection fee increase, as recommended in the *Water Connection Fee Update* (Raftelis, 2004), to account for future growth. A copy of City Ordinance No. 1320 can be found in Appendix D.

2.2.5 Imported Water

2.2.5.1 Existing Sources

The City of Banning is eligible to receive imported water from the SGPWA. Other eligible major water purveyors include BCVWD, SMWC, YVWD, and Cabazon Water District. The SGPWA has a contract with the DWR for 17,300 acre-ft/yr of SWP water from Silverwood Reservoir via the Devil's Canyon Power Plant.

The allocation of the water among the various agencies within the SGPWA is based on assessed valuation. If a water purveyor has 40 percent of the SGPWA's total assessed valuation, then the water purveyor would be entitled to up to 40 percent of the SGPWA's entitlement. A report prepared in May 1988 by an Agency engineer indicates that the City is "entitled" to 38 percent or 6,574 acre-ft/yr of the SGPWA's entitlement. This percentage may have changed due to recent assessments.

The SGPWA's entitlement of SWP water is not guaranteed every year. Climatic variability, the availability of diversion, storage and conveyance facilities, environmental concerns, and increasing demand for SWP water affect the reliability of SWP delivery. *The State Water Project Delivery Reliability Report* (DWR, 2002) estimated the average delivery of SWP water in 2001 to be 71% of contract entitlement. This average is projected to increase to 75% in 2021. In order to receive the average delivery over time, the City must be able to take the maximum amount of their entitlement to compensate for the years when less than the average delivery is available.

2.2.5.2 Planned Sources

The SGPWA is currently working in cooperation with the San Bernardino Valley Municipal Water District and the California Department of Water Resources Division of Engineering to construct the East Branch Extension Project of the SWP. The East Branch Extension Phase I has been completed and may bring up to 8,650 acre-ft/yr of water to the San Gorgonio Pass Subbasin. The Environmental Impact Report (EIR) for Phase II is underway and the project will be completed by late 2005 or early 2006. Phase II will bring an additional 8,650 acre-ft/yr of water to the subbasin; however, the total capacity is greater. Current Table A water and any additional Table A water purchased can easily be taken—the East Branch Extension has a maximum capacity of 48 cfs or 35,000 acre-ft/yr. SGPWA plans to use the imported water to recharge the Beaumont storage unit via the Noble Creek spreading grounds in Cherry Valley. The City is entitled to 3,287 acre-ft/yr per phase for a total of 6,574 acre-ft/yr.

2.3 Transfer or Exchange Opportunities

Currently, the City of Banning has no plans for water transfers or exchanges. The City believes it can meet its future water demand with existing sources, conservation, recycled water, and SWP water.

2.4 Desalinated Water

From 1999 to 2003, total dissolved solids (TDS) concentrations in groundwater sources ranged from 150 mg/L to 360 mg/L with an average of 206 mg/L. The secondary MCL range for TDS in drinking water is 500-1000 mg/L and the TDS basin objective for the San Timoteo Groundwater Management Zone is 297 mg/L. Only three samples exceeded the basin objective: one in the Beaumont Storage Unit and two in the

Banning Bench Storage Unit. As these results show, TDS is not a problem in the City's groundwater sources, and therefore, desalination is not needed.

2.5 Water Quality of Existing Sources

The City of Banning's existing groundwater quality was reviewed and found to be excellent. Based on trends extrapolated from water quality data for the period ranging from 1984 to 2004, future groundwater quality is also expected to be of high quality. Moreover, the City's water supply isn't expected to be threatened by water quality issues in the future.

3. WATER USE

3.1 Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:
>
> (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sale to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.
>
> (2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

3.2 Past, Current, and Projected Water Use

3.2.1 Past and Current Water Use

In 1990, the demand on the City's water supply was 4,096 acre-feet. In the 2000, the demand almost doubled at 8,032 acre-feet. During this period, the population grew from an estimated 20,570 to 23,662. This large increase in water demand in relation to population growth is due, in part, to increased commercial consumption and irrigation. During this period Sun Lakes Development Executive Golf Course, Banning Rehabilitation and Counseling Center, Mission Laundry, and Morongo Sand and Gravel began requesting water service, which contributed heavily to the irrigation water demand.

Past and current water use has been summarized from metered water deliveries in Table 3-1. Well production records show a greater water demand than the amount measured at individual accounts. This is due to several factors, including inaccurate meters, main flushing, fire flows, water hydrant testing, street cleaning, distribution system maintenance, and leaks. In 2004 approximately 11% of water produced was lost due to the above factors. In the past the City had not maintained records of the amount of water that was used for fire flows, main flushing, and street cleaning. These water uses are now being recorded and the City estimates that the percent water lost is approximately 8%. This percentage may decrease over time as the City continues to replace old leaking pipes under its Capital Improvement Plan.

Table 3-1 illustrates past, current, and projected water use from 1990 to 2030 based on planned development.

Table 3-1
Past, Current, and Projected Water Use Based on Planned Development
(acre-ft/yr)

Water Use Sectors	1990	1995	2000	2004	2005	2010	2015	2020	2025	2030
Residential	2,319	3,431	4,745	5,263	5,724	8,031	10,338	12,645	14,953	17,260
Commercial	1,300	1,861	2,161	2,289	2,349	2,649	2,950	3,250	3,551	3,851
Industrial	0	77	83	136	151	226	301	375	450	525
Public	96	16	6	83	84	91	97	104	110	117
Irrigation	381	845	1,037	1,110	1,176	1,504	1,832	2,160	2,488	2,816
Total	**4,096**	**6,230**	**8,032**	**8,881**	**9,484**	**12,501**	**15,518**	**18,535**	**21,552**	**24,569**

3.2.2 Projected Water Demands by Land Development

Future water demand can be projected based on the expected development in the region. Table 1-3 shows a large increase in agricultural lands, rural residential lands, and open spaces. These increases reflect the City's commitment to preserving hillsides and open spaces for the enjoyment of its citizens. However, these landuses do not require connection to the City's water system, and therefore, were not included in the determination of water demand based on acreage of future landuse. Water demand, as it corresponds to landuse, was determined using the water duty factors reported in the *City of Banning Water System Hydraulic Modeling Report* (Montgomery Watson Harza, 2002).

The acreage of developed land and land available for development within the City's limits, sphere of influence, and planning area is shown in Table 3-2. Landuse designations were categorized based on water billing accounts. For example, schools are typically considered a public facility, yet are billed as a commercial account in the City of Banning. The greatest percent increase in development will be in the residential, commercial, and irrigation sectors. Industrial and public facilities will approximately double at buildout.

Table 3-2
Total Acreage by Landuse Designation at Buildout

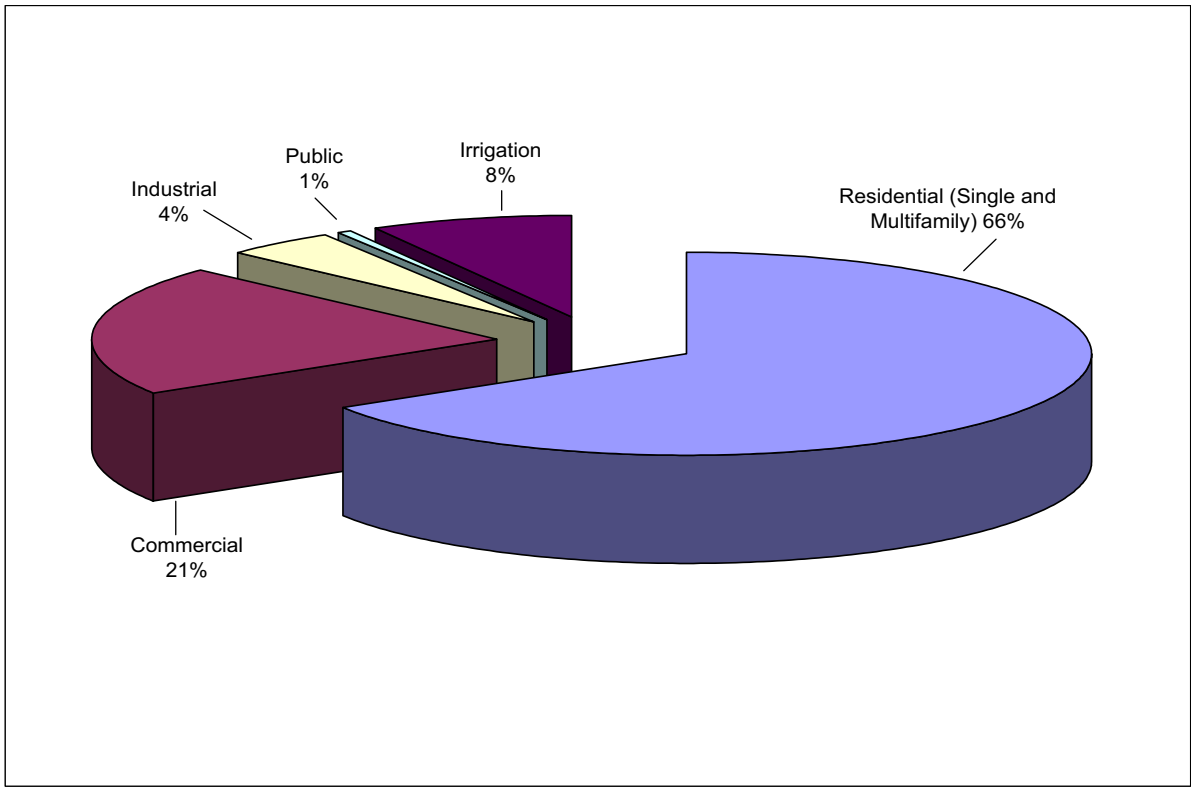
	City limits		SOI		Planning Area		Total		
Water Use Sectors	**Acres Developed**	**Acres Vacant**	**Acres Developed**	**Acres Vacant**	**Acres Developed**	**Acres Vacant**	**Acres Developed**	**Acres Vacant**	**Total Acres**
Single & Multi-Family Residential									
Rural Residential	123	813	9	901	200	647	331	2,360	2,691
Very Low Density Residential	231	1,707	22	199			253	1,906	2,159
Low Density Residential	1,326	1,839		142	2	130	1,329	2,111	3,440
Medium Density Residential	678	434		41	0	30	678	504	1,182
High Density Residential	220	263	0	10			220	272	493
subtotal	2,578	5,056	30	1,292	202	806	2,811	7,154	9,964
Commercial									
General Commercial	288	468	0	30			288	497	786
Highway Serving Commercial	104	7					104	7	111
Downtown Commercial	92	11					92	11	103
Professional Office	23	19					23	19	42
Business Park	1	16					1	16	17
Airport	114	166					114	166	280
Commercial Ranch/Agricultural	0	78	74	725	30	632	104	1,434	1,538
Cemetery	13	3					13	3	15
School	138	96					138	96	234
subtotal	772	864	74	754	30	632	876	2,250	3,126
Industrial									
Industrial	153	278					153	278	431
Industrial - Mineral Resources	189	28					189	28	216
subtotal	341	306					341	306	647
Public Facilities									
Fire Station	4	0		3			4	3	6
Government	24	40					24	40	64
Hospital	11	0					11	0	11
subtotal	38	40	0	3	0	0	38	43	81
Irrigation									
Parks and Golf Courses	320	837		26	30	16	350	879	1,229
subtotal	320	837		26	30	16	350	879	1,229
Total	**4,050**	**7,102**	**104**	**2,076**	**262**	**1,453**	**4,416**	**10,631**	**15,047**

Projected water use by landuse designation is summarized in Table 3-3 and shown graphically in Figure 3-1. The date of final buildout is unknown. At buildout, the City estimates the population to be 82,000. If the population were to continue to grow at the rate projected by SCAG forecasts, this population wouldn't occur until 2077. As a worst case scenario, buildout was assumed to occur at 2050.

Table 3-3
Total Projected Water Use Based on Landuse

Water Use Sectors	Current Land Use (%)	Future Land Use (%)
Residential	63	66
Commercial	20	21
Industrial	8	4
Public	1	1
Irrigation	8	8

Figure 3-1
Total Water Use Based on Landuse Designation in 2050



3.2.2.1 Multiple and Single-Family Residential

Individual single family, condominiums, apartments, and mobilehome living units characterize the residential use sector. Water consumption within this sector is comprised of indoor and outdoor uses. Indoor water use includes sanitation, bathing, laundry, drinking, and cooking. Outdoor water use is primarily for landscape irrigation, but also includes washing automobiles, maintaining swimming pools, and cleaning sidewalks and driveways. Rural residential landuses allow for animal husbandry and would also be served under residential water accounts.

While population is increasing, housing density is increasing as well because hillside density transfers are applied to rural and agricultural residential areas. This will result in a decrease in residential irrigation on a per capita basis.

3.2.2.2 Commercial

The City of Banning's commercial landuse sector includes a variety of customers, including office buildings, restaurants, hotels, automobile repair and gas stations, grocery stores, shopping centers, and other facilities serving the public. Cal-Trans is a large commercial client for whom the City provides water. Although Cal-Trans primarily uses water for irrigation along the sides of the freeway, their water use falls under the commercial category. The City's schools, cemeteries, and airport are also served water under a commercial account. Ranch/Agricultural lands used for commercial purposes, such as feed stores, commercial stables, and bed & breakfasts, have also been considered commercial water accounts.

3.2.2.3 Industrial

The City's industrial sector has historically been divided between airport-related uses and traditional industrial uses, ranging from storage to heavy manufacturing. Industrial development has been an important source of employment in the City and areas will be designated within the City for continued development; however, at buildout, the industrial sector is expected decrease to 4 percent of total landuse.

3.2.2.4 Public

The City's public facilities include governmental institutions, such as City Hall, fire stations, hospitals, railroads, and Interstate 10. This sector will continue to expand as the City grows.

3.2.2.5 Irrigation

The City plans to set aside over one quarter of the land within the City boundaries, sphere of influence, and planning area for open space, including lands preserved for natural resources, hillside preservation, and recreation. Most of this land will not require connections to the City's water system. The landscaped areas, such as parks and golf courses, can use recycled water to meet their water demand.

3.2.2.6 Agricultural

The only agriculture within the City of Banning is animal husbandry. The City does not expect other agricultural activities to take root within their jurisdiction; however, agricultural landuse is expected to increase as more agricultural land is set aside for hillside preservation.

3.2.3 Projected Water Demands by Population Growth

The SCAG population forecasts presented in Section 1 were used to estimate future water demand. The average water demand per EDU in the City of Banning is 0.67 acre-ft/yr (NBS/Lowry, 1994). This multiplier was used to estimate residential demand as shown in Table 3-4. City Water Reports for 2004 show residential water demand to be 59% of total water demand.

Table 3-4
Projected Water Demand Based on Population Growth

	2005	2010	2015	2020	2025	2030
Population	26,917	29,213	33,623	37,972	42,140	46,140
Households	9,962	11,140	13,211	15,305	17,371	19,418
Residential Demand (acre-ft/yr)	6,675	7,464	8,851	10,254	11,639	13,010
Total Demand (acre-ft/yr)	**11,313**	**12,651**	**15,002**	**17,380**	**19,726**	**22,051**

4. WATER RESOURCE RELIABILITY

4.1 Law

10620. (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

1) An average water year.
2) A single dry water year.
3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

4.2 Reliability of Available Water Supplies

Currently, the City relies exclusively on groundwater to meet their water demand. Groundwater production is maintained at a level within the perennial yield of the groundwater basins as estimated by Geoscience (2003). The amount of groundwater in storage within the City of Banning area is estimated to be between 1.4 and 2.6 million acre-feet. During dry years or emergency situations the City has the ability to produce water beyond the perennial yield of the groundwater basins.

4.3 Frequency and Magnitude of Supply Deficiencies

Historically, the City of Banning has been able to meet the water demand of its customers with available groundwater supplies. As the City has grown, groundwater production has increased proportionately. Water demand has now increased to the level where production limitations are being realized in certain portions of the City during dry years. Declining water levels have also been detected in the Banning

Canyon and Banning Bench since 1995. In response, the City initiated a study to determine the safe yield of their underlying groundwater storage units. Pumping has been redistributed between storage units and the production in each storage unit is being operated in accordance with the maximum perennial yield to prevent groundwater level decline. The Canyon wells experienced a marked decrease in water levels in 2002 due to drought conditions, but have since recovered. During this period the City was still able to provide adequate water to its customers.

4.4 Plans to Affirm a Reliable Water Supply

The City of Banning is pursuing several options to further secure current water supplies and develop additional water supplies to meet future demands. The City has an agreement with BCVWD to share in the construction cost and capacity of three new wells in the Beaumont storage unit and a water treatment plant to treat SWP water. One of these wells has already been constructed. The other two wells will be constructed in 2005 and be operational in early 2006. BCVWD's distribution system is tied into the City's system to provide additional water from the Beaumont storage unit and will provide water from the new wells being constructed.

The City plans to purchase State Water Project water in the near future as well. SGPWA has overseen the completion of Phase I of the East Branch Extension, which can deliver 8,650 acre-feet of water per year. This water will be released to Noble Creek and Little San Gorgonio spreading grounds for percolation into the Beaumont storage unit. The water can then be extracted by the City of Banning through their existing wells and wells currently being constructed with BCVWD in the Beaumont storage unit. The completion of the East Branch Extension Phase II will double the volume of imported water delivered to the area by SGPWA. The City is planning to purchase additional State Water Project water directly.

The City will increase local supplies by pumping groundwater from the Cabazon storage unit. Groundwater from the Cabazon storage unit will be available before 2010. The City's recycled water program may be implemented before 2010 as well. Recycled water will be used to meet irrigation demand and offset potable water demand. Recycled water can also be recharged to replenish the East Banning storage unit.

The reliability of local water supplies can be further enhanced by implementing water conservation measures. Residential water demand is the largest component of overall demand and several studies have concluded that at least 50 percent of residential water demand in the Banning area is for outdoor use, specifically irrigation (Mayer *et al*., 1999; Gleick *et al*., 2003). In 2004, outdoor residential water demand was approximately 2,600 acre-ft/yr and in 2030 demand will be approximately 8,600 acre-ft/yr. A portion of this demand can be reduced through the use of weather-based irrigation controllers. A cooperative study conducted by Irvine Ranch Water District (IRWD), Metropolitan Water District of Southern California, and Municipal Water District of Orange County found that the use of ET irrigation controllers resulted in water savings of 37 gallons per day for single-family homes (IRWD, 2001). This would result in a potential savings of about 1,100 acre-ft/yr by 2030. A reduction in irrigation demand would result in a decrease in return flows; however, that loss will be offset by the additional water supply available due to conservation.

The City of Banning may also consider the use of greywater to reduce potable water demand. Greywater is wastewater from baths, sinks, dishwashers, and washing machines. Greywater can be recycled and used for irrigation, toilets, and exterior washing. This requires the installation of a dual wastewater

plumbing system to separate greywater from blackwater. A typically system consists of a treatment system, bilge pump, holding tank, and irrigation or leaching system. Greywater systems are not possible in all areas and their applicability will depend on location, soil type, and groundwater levels. These systems require regular or periodic maintenance, which is the responsibility of the owner. The California Building Standards Commission has specific requirements for greywater systems including the submittal and approval of a plot plan by the City before a permit can be issued for a greywater system.

4.5 Reliability Comparison

Table 4-1 and Figures 4-1, 4-2, and 4-3 show water supplies for each source in an average water year, a single dry year, and multiple dry years, respectively. Historical production records have shown the Beaumont, Cabazon, East Banning, and West Banning storage units to have no production limitations during dry years. However, the most recent dry year, 2002, demonstrated that production in Banning Canyon and Banning Bench storage units is limited. As shown in Table 1-3, 2002 was the driest year between 1916 and 2004 and 2002-2004 were the driest consecutive three years. Therefore, those years were used for single-dry year supply estimates and multiple-dry years supply estimates for Banning Canyon and Banning Bench storage units.

Water is produced from the Beaumont storage unit at a level that meets the City's water demand. In single-dry and multiple-dry water years the City can pump enough water from the Beaumont storage unit to ensure an adequate water supply for its customers. Table 4-1 shows dry year water supplies in the Cabazon, East Banning, and West Banning storage units to be the middle of the maximum perennial yield range, however, these storage units can be operated above their safe yield during dry years.

Recycled water supplies will not diminish in dry water years. Although demand will decrease due to conservation measures, this will mainly affect outdoor water use. Any decrease in indoor water will be negligible and will not significantly decrease recycled water production. Moreover, recycled water production exceeds recycled water demand—further reassuring a sufficient recycled water supply.

Return flows from irrigation will decrease in dry years due to conservation measures that restrict irrigation during the day. The decrease in return flows is proportionate to the overall decrease in water demand during dry years, which is described in detail in section 5. Return flows in Table 4-1 were calculated from projected water demands based on planned development.

SWP water supply will be affected during single-dry and multiple-dry water years. In *The State Water Project Delivery Reliability Report* (DWR, 2002) the average amount of Table A water that will be delivered during single-dry and multiple-dry water years was projected for the years 2006, 2011, 2016, and 2021. The average Table A delivery during a single dry year in 2006 will be 19 percent of its full amount. In 2011, 2016, and 2021 the average amount of water delivered will be 20 percent of full Table A entitlements. In table 4-1 19 percent of SWP water was assumed to be available in a single-dry year in 2005 and 20 percent in the years 2010-2030. For multiple dry water years, the average delivery during the 4-year drought of 1931-1934 was used for SWP water supply projections. For the years 2005 and 2010, 38 percent of full Table A water will be available and 39 percent will be available in the following years.

Table 4-1
Average, Single-Dry, and Multiple-Dry Water Years Supplies per Water Supply Source
(acre-ft/yr)

Water Supply Source	2005			2010			2015		
	Average Year	Dry Year	Multiple Dry Years	Average Year	Dry Year	Multiple Dry Years	Average Year	Dry Year	Multiple Dry Years
Banning Canyon/ Banning Bench	5,000	3,180	4,068	5,000	3,180	4,068	5,000	3,180	4,068
Beaumont	5,900	5,900	5,900	400	5,900	2,000	400	5,000	2,000
Cabazon	0	0	0	2,050	2,050	2,050	2,050	2,050	2,050
East Banning	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
West Banning	350	350	350	350	350	350	350	350	350
Recycled Water Use	0	0	0	1,504	1,504	1,504	1,832	1,832	1,832
Return Flows from Irrigation	1,009	977	814	1,380	1,336	1,113	1,750	1,694	1,411
State Water Project	0	0	0	4,000	800	1,520	8,771	1,754	3,421
Total Supply	**13,309**	**11,457**	**12,182**	**15,734**	**16,169**	**13,655**	**21,203**	**16,910**	**16,182**

Water Supply Source	2020			2025			2030		
	Average Year	Dry Year	Multiple Dry Years	Average Year	Dry Year	Multiple Dry Years	Average Year	Dry Year	Multiple Dry Years
Banning Canyon/ Banning Bench	5,000	3,180	4,068	5,000	3,180	4,068	5,000	3,180	4,068
Beaumont	400	7,000	3,000	4,000	9,000	3,500	6,000	11,000	6,000
Cabazon	2,050	2,050	2,050	2,050	2,050	2,050	2,050	2,050	2,050
East Banning	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
West Banning	350	350	350	350	350	350	350	350	350
Recycled Water Use	2,160	2,160	2,160	2,488	2,488	2,488	2,816	2,816	2,816
Return Flows from Irrigation	2,121	2,052	1,710	2,491	2,410	2,008	2,862	2,768	2,307
State Water Project	9,266	1,853	3,614	9,266	1,853	3,614	9,266	1,853	3,614
Total Supply	**22,397**	**19,695**	**18,002**	**26,695**	**22,382**	**19,128**	**29,394**	**25,068**	**22,255**

Figure 4-1
Average Water Year Supplies

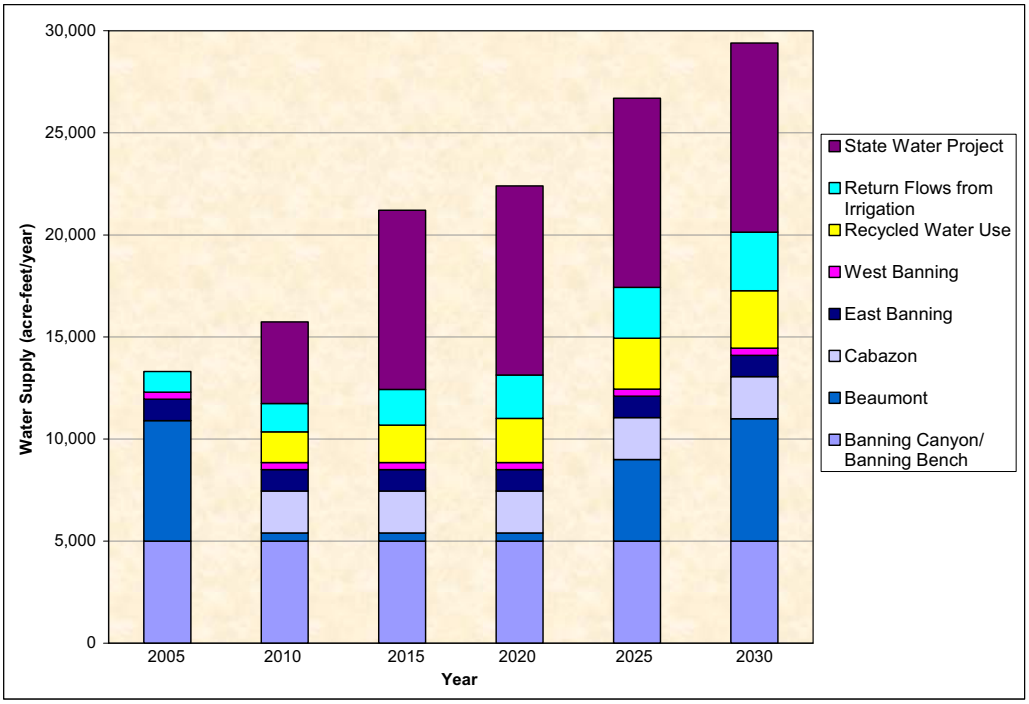


Figure 4-2
Single-Dry Water Year Supplies

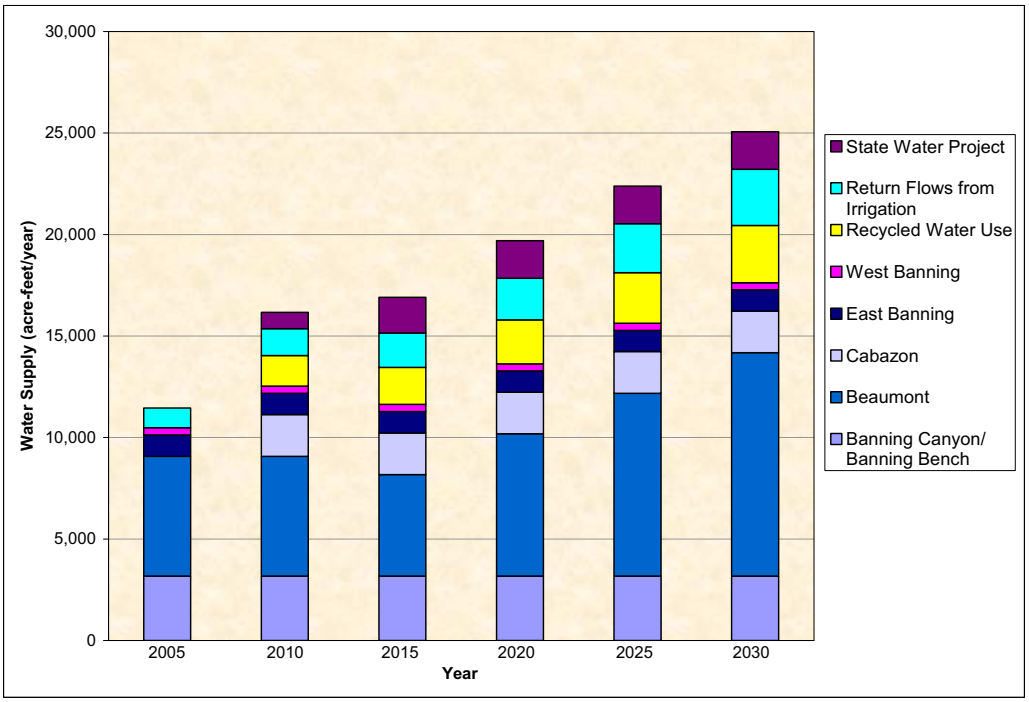
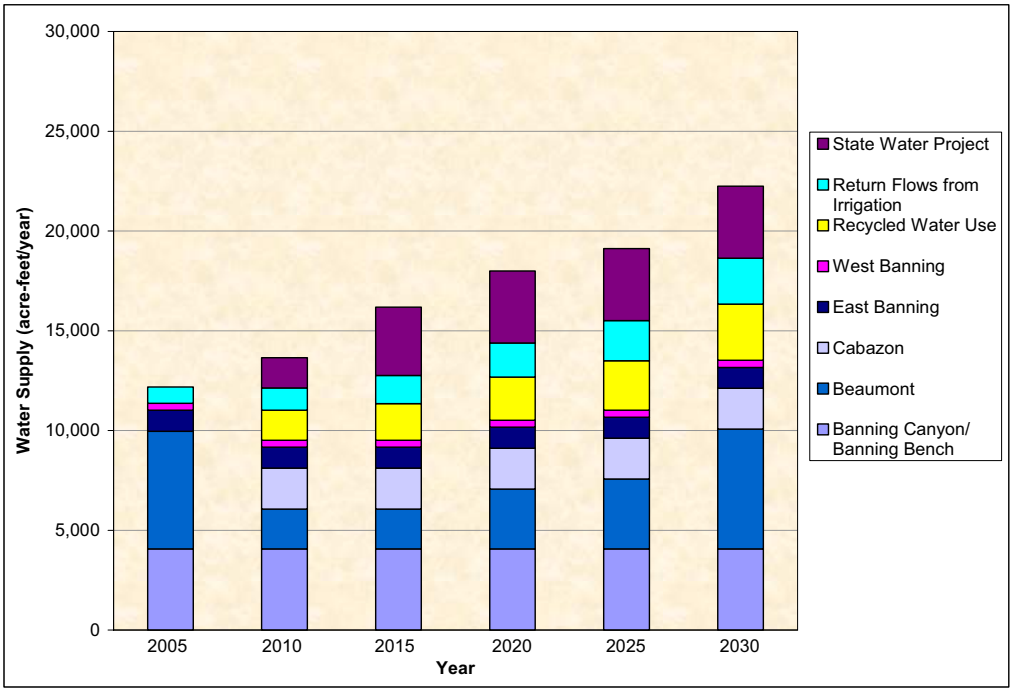


Figure 4-3
Supplies for Multiple-Dry Water Years



5. SUPPLY AND DEMAND COMPARISONS

5.1 Law

> 10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

5.2 Twenty-Five Year Comparison

The projected population growth and land development presented in Section 3 generates two different scenarios for water demand versus supply over time. Population growth data was provided by SCAG and future development was determined by landuse at buildout from the City of Banning's General Plan. In addition to the inherent uncertainties of population growth, the year of buildout is unknown. Therefore, the twenty-five year comparison considers the following two scenarios.

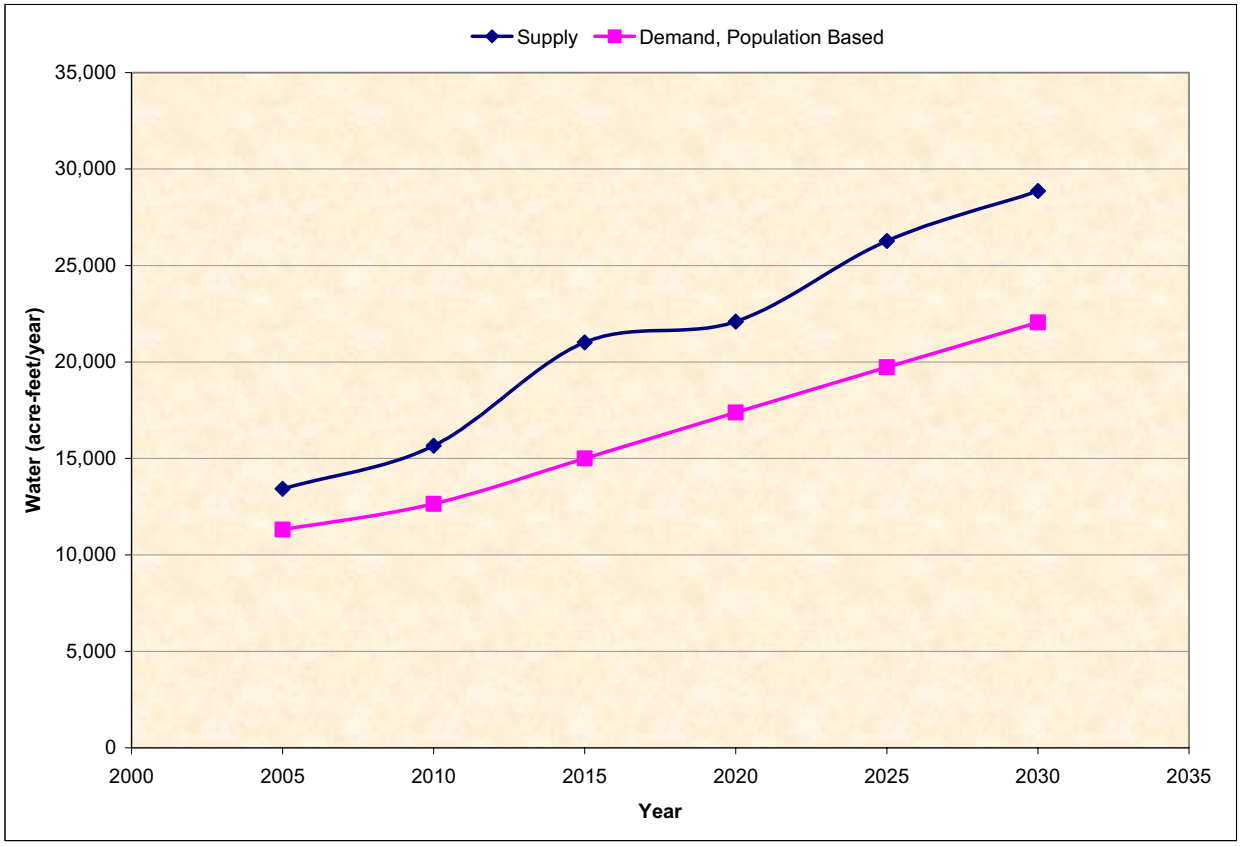
5.2.1 Supply vs. Demand by Population

Table 5-1 compares the current and projected water supply and demand based on the forecasted increase in population and Figure 5-1 illustrates the corresponding water demand versus supply. The individual components for the water supply totals are provided in Table 2-1 and the individual components for determining the demand totals are shown in Table 3-4. Over the next twenty-five years, the City of Banning is anticipated to have a surplus of water to meet its customer's water demand.

Table 5-1
Projected Supply and Demand Comparison Based on Population Growth
(acre-ft/yr)

	2005	2010	2015	2020	2025	2030
Supply Totals	13,428	15,663	21,017	22,098	26,281	28,863
Demand Totals	11,313	12,651	15,002	17,380	19,726	22,051
Supply Surplus	**2,115**	**3,012**	**6,015**	**4,718**	**6,555**	**6,812**

Figure 5-1
Supply Reliability and Demand Comparison by Population Growth



5.2.2 Supply vs. Demand by Land Development

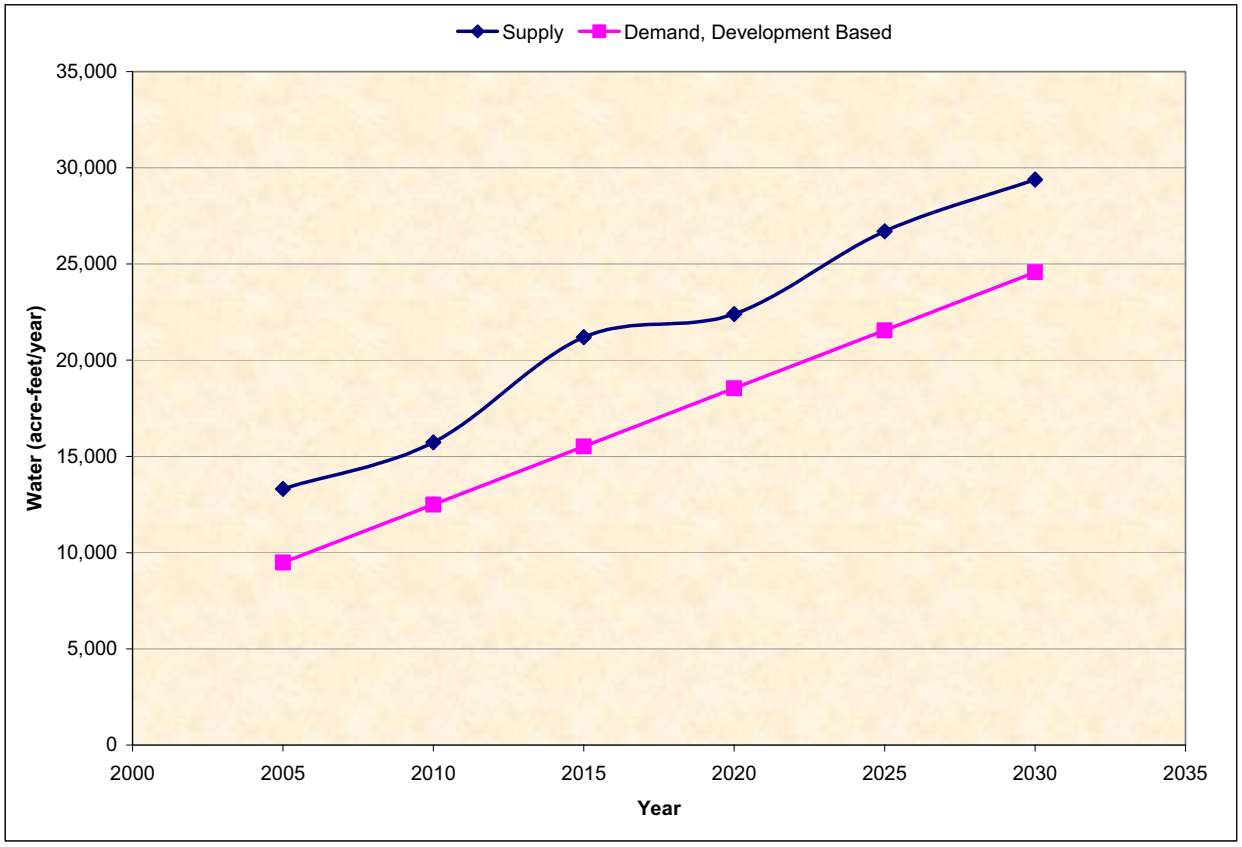
Table 5-2 compares current and projected water supply and demand based on future land development and Figure 5-2 graphically compares the corresponding water demand and water supply. The individual components for the water supply totals are provided in Table 4-1 and the individual components for determining the demand totals are shown in Table 3-1. Water supply totals vary slightly from those presented in Table 5-1, as return flows from irrigation depend upon water demand projections.

In 2005, water demand based on landuse is less than the estimated water demand using population growth and is probably more accurate, as the 2005 demand is similar to the amount of water delivered in 2004. By 2015, however, demand by land development exceeds that estimated by population growth. Nonetheless, in all cases, water supply exceeds water demand.

Table 5-2
Projected Supply and Demand Comparison Based on Land Development
(acre-ft/yr)

	2005	2010	2015	2020	2025	2030
Supply Totals	13,309	15,734	21,203	22,397	26,695	29,394
Demand Totals	9,484	12,501	15,518	18,535	21,552	24,569
Supply Surplus	**3,825**	**3,232**	**5,685**	**3,862**	**5,144**	**4,825**

Figure 5-2
Supply Reliability and Demand Comparison by Land Development



5.3 Below Normal Water Year Comparisons

Table 5-3 compares total supply and total demand based on land development during an average, a single dry, and multiple dry water years. Total water supply during dry years was described in detail in Section 4. Supplies were compared to development based demand because it's greater than population growth induced water demand. During dry years demand will change. Studies conducted by a neighboring water district, Carlsbad Municipal Water District (2000), have shown that urban water demands are about seven percent greater and irrigation water demands are about nine percent greater than normal during hot, dry weather. Total demand during dry years will also decrease due to voluntary and mandatory conservation measures as outlined in the City's Water Shortage Contingency Plan. For a single dry year, residential water demand was assumed to increase seven percent, irrigation demand to increase nine percent, and total demand to decrease ten percent. During multiple dry years residential and irrigation demands were assumed to increase by the same percentage, but total demand was assumed to decrease by 25 percent due to the implementation of Stage 2 of the Water Shortage Contingency Plan.

As shown in Table 5-3, the City will have a supply surplus during dry years through 2030. If needed, the City may also extract water from their groundwater storage units above the amounts included in the total supply projections below. The vast amount of groundwater in storage within the City's area, 1.4 to 2.6 million acre-feet, provides a reliable safety margin for the City in times of drought.

Table 5-3
Average, Single-Dry, and Multiple-Dry Water Years Supply and Demand Comparisons
(acre-ft/yr)

Water Supply Source	2005			2010			2015		
	Average Year	Dry Year	Multiple Dry Years	Average Year	Dry Year	Multiple Dry Years	Average Year	Dry Year	Multiple Dry Years
Total Supply	13,309	11,457	12,182	15,734	16,169	13,655	21,203	16,910	16,182
Total Demand	9,484	8,992	7,493	12,501	11,879	9,899	15,518	14,766	12,305
Supply Surplus	**3,825**	**2,466**	**4,689**	**3,232**	**4,290**	**3,756**	**5,685**	**2,144**	**3,877**

Water Supply Source	2020			2025			2030		
	Average Year	Dry Year	Multiple Dry Years	Average Year	Dry Year	Multiple Dry Years	Average Year	Dry Year	Multiple Dry Years
Total Supply	22,397	19,695	18,002	26,695	22,382	19,128	29,394	25,068	22,255
Total Demand	18,535	17,653	14,711	21,552	20,540	17,117	24,569	23,427	19,523
Supply Surplus	**3,862**	**2,042**	**3,291**	**5,144**	**1,841**	**2,012**	**4,825**	**1,641**	**2,732**

6. WATER SHORTAGE CONTINGENCY PLAN

6.1 Law

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50% reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street-cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50% reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

6.2 Three Year Minimum Water Supply

The City of Banning's minimum water supply for the current year and the next three years is shown in Table 6-1. The water supply and demand were based on dry-year assumptions and values described in Sections 4 and 5. Should an extended drought occur over the next three years, the City would have a surplus of water and be able to meet the water needs of its customers.

Table 6-1
Minimum Water Supply During Multiple-Dry Years
(acre-ft/yr)

	2005	2006	2007	2008
Total Water Supply	13,309	12,182	12,182	12,182
Total Demand	9,484	7,974	8,456	8,937
Supply Surplus	**3,825**	**4,208**	**3,727**	**3,246**

6.3 Preparation for Catastrophic Water Supply Interruptions

The City of Banning has an Emergency Response Plan as required by the California Department of Health Services – Drinking Water Division and has submitted a Security Vulnerability Assessment Report as required by the Federal EPA. The guidelines of both of these items are presently being followed by the Water Utility Department.

The City of Banning adopted its Water Shortage Contingency Plan (WSCP) under City Ordinance 1040 in 1991 and can be found in Appendix D. The WSCP outlines a plan of action in the event of a water shortage caused by loss of electrical power, an earthquake, pipeline breakage, or any other potential water shortage caused by a disaster or facility failure that results in the City's inability to meet the water demands of its customers.

6.3.1 Regional Power Outage, Earthquake, or Other Disaster

The City of Banning's sphere of influence overlays several faults, the most prominent being the Banning Fault and McMullen Fault. The Banning Fault defines the north side of the Banning Bench Storage Unit. It is characterized by a right-lateral strike-slip displacement on the northwest trending faults with a normal dip-slip displacement (Geoscience, 2003). The McMullen Fault runs along the southwestern boundary of the Banning Bench Storage Unit. An earthquake could result in the loss of power and damage to the water distribution system and aboveground storage reservoirs.

The City of Banning has its own field crews, equipment, and materials to make immediate responses and repairs to the water system. Stand-by crews are on call at all times to respond promptly. The Water Utility is experienced in making emergency repairs as needed to keep customers in service, as emergency responses are common place for the Department (George Thacker, personal communication, March 11, 2005).

Water production wells are located throughout the service area, which provides the ability to supply water in different portions of the City. Also, the City has a 12" emergency inter-tie connection with BCVWD at

the western boundary of the service area located at the intersection of Highland Springs Avenue and Sun Lakes Blvd.

There are three well sites (C-2, M-12, and Well 8) with backup generators to operate these wells at full power when the power fails. Also, one well site (Well 10) has a diesel motor driven pump system. However, these backup systems require manual turn on. Wells 1, 3, 4, and 5 are equipped with Pelton wheels. These wells can be operated by a hydraulic-driven pump using existing water under pressure in the distribution system. These well are located down gradient from Wells 8 and 10, which would be operated to maintain pressure in the system. If additional water supply capacity is needed, portable generators can be obtained to operate other remaining wells and booster stations.

The capacities of the wells with emergency backup systems are shown in Table 6-2. The total water available from the use of these eight wells is 6,400 gpm or 28.28 acre-ft/day. This is exceeds the average demand in 2005 of 25.98 acre-ft/day. Additional water is available in aboveground storage as shown in Table 6-3 (Montgomery Watson Harza, 2002). The total emergency water supply available is 65.2 acre-feet. In an emergency situation the City needs to meet not just its average water demand, but its peak water demand as well. In the *Water System Hydraulic Modeling Report* (Montgomery Watson Harza, 2002) the City's peak water demand was estimated to be 2.24 times the average daily demand. The City's current emergency water supply will meet its peak water demand temporarily. The City will need to invest in additional emergency water storage as water demand increases.

Table 6-2
Wells with Emergency Generators and Backup Systems

Well	Location	Total Capacity		Remarks
		GPM	Acre-ft/ Day	
C-2	Beaumont Storage Unit	1,200	5.30	Generator for well and boosters
M-12	West Banning Storage Unit	1,300	5.74	Generator
1	Banning Bench Storage	1,000	4.42	Pelton Well
3	Banning Bench Storage	500	2.21	Pelton Well
4	Middle Banning Canyon Storage Unit	200	0.88	Pelton Well
5	Middle Banning Canyon Storage Unit	600	2.65	Pelton Well
8	Middle Banning Canyon Storage Unit	600	2.65	Generator
9	Upper Banning Canyon Storage Unit	600	2.65	Generator
10	Upper Banning Canyon Storage Unit	400	1.77	Diesel motor driven pump
Total		**6,400**	**28.28**	

Table 6-3
Available Emergency Reservoir Storage

Available Reservoirs	Total Aboveground Storage (MG)	Total Aboveground Storage (acre-feet)
C2 Tank	0.22	0.68
C3 Tank	0.06	0.18
C4 Tank	0.05	0.15
C5 Tank	0.05	0.15
High Valley Tank	0.084	0.26
Mountain Tank	0.25	0.77
San Gorgonio Reservoir No. 1	2.60	7.98
San Gorgonio Reservoir No. 2	2.00	6.14
San Gorgonio Reservoir No. 3	1.00	3.07
Southwest Reservoir	1.50	4.60
Sunset Reservoir No. 1	2.10	6.44
Sunset Reservoir No. 2	2.10	6.44
Total	**12.01**	**36.87**

6.4 Stages of Action

The City's WSCP consists of four stages of action to progressively reduce water consumption during increasingly dramatic water shortages. Table 6-4 shows a rationing plan the City could adopt to achieve the reduction goal listed for each stage.

Table 6-4
Rationing Stages and Reduction Goals

Shortage	Stage	Reduction Goal	Type of Program
Up to 15%	1	15%	Voluntary
15% to 25%	2	25%	Mandatory
25% to 35%	3	35%	Mandatory
35% to 50%	4	50%	Mandatory

6.4.1 Stage 1

Stage 1 occurs when the City of Banning is able to meet all of the demands of its customers in the immediate future. During this stage, the City will recommend voluntary conservation measures. All water users will be advised to use water wisely, prevent the waste or unreasonable use of water, and reduce water consumption to levels necessary for ordinary domestic and commercial purposes.

6.4.2 Stage 2

Stage 2 occurs when a sudden and unexpected water supply shortage occurs that prevents the City from meeting the water demands of its customers. If this should occur, the City Council shall immediately hold a public hearing wherein consumers of the water supply shall have the opportunity to protest and to present their respective needs to the Council. No public hearing will be required in the event of a breakage or failure of a dam, pump, pipeline, or conduit. At the public hearing, the Council may declare a water shortage emergency condition and the following mandatory rules and regulations shall be in effect immediately following such declaration:

a) Washing driveways, parking lots, or other hard surfaced area, or building exteriors at any time, except to alleviate immediate fire hazards, is prohibited;

b) Parks, golf courses and school grounds are to be irrigated during nighttime hours only, between sunset and sunrise;

c) Lawn watering and landscape irrigating, including construction meter use, is prohibited between the hours of 10:00 am to 5:00 pm;

d) Running water shall not be used for washing privately owned vehicles. A bucket may be used for the washing of vehicles and only hoses equipped with shut-off nozzles may be used for rinsing;

e) Restaurants are requested not to provide drinking water to patrons except by request;

f) Commercial nurseries shall use water only during the hours from midnight to 6:00 am. Irrigation of propagation beds and watering of livestock is permitted as necessary during any hours;

g) Golf courses using reclaimed water are exempted from these restrictions.

6.4.3 Stage 3

Water supply and demand will be continuously monitored by the Water Operations Superintendent. If further reductions in water consumption are required, Stage 3 will be declared following a public hearing as set forth in Stage 2 and the City Council will declare an emergency water supply shortage and the following mandatory water conservation measures shall apply:

a) Parks and schools shall be watered on alternate days during the hours between sunset to sunrise, the schedule of which shall be set following the public hearing;

b) Golf courses that utilize domestic water from the City of Banning's domestic system may irrigate greens only during the hours between sunset to sunrise. Golf courses utilizing reclaimed water are exempted from this restriction;

c) Other lawn watering and landscape irrigating, including construction water use, are restricted as follows: customers with even numbered street addresses may water only on even numbered days, customers with odd numbered street addressees may water only on odd numbered days, and no watering or irrigating shall be done between the hours of 10:00 am to 5:00 pm on any day;

d) Washing down of driveways, parking lots, or other paved surfaces is prohibited;

e) Washing of vehicles is restricted to commercial car wash establishments which recycle their water;

f) Filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes is prohibited;

g) Restaurants shall not serve drinking water to patrons except by request;

h) No new construction meter permits shall be issued by the Agency;

i) Construction metered water shall not be used for earth work or road construction purposes;

j) Watering of livestock is permitted as necessary during any hours;

k) Commercial nurseries may use water only between the hours of midnight and 6:00 am. Irrigation of propagation beds is permitted as necessary during any hours. Commercial nurseries utilizing reclaimed water are exempted from this restriction.

6.4.4 Stage 4

Stage 4 will occur if the water shortage condition continues or worsens and measures to reduce water use required by Stage 3 are not adequate. Following a declaration by the City Council that an emergency water supply shortage due to a major failure in a supply of distribution facility exists, the following mandatory water conservation measures shall apply:

a) Watering of parks, school grounds and golf courses is prohibited, except by reclaimed water;

b) Watering of lawn and irrigating of landscape is prohibited;

c) Washing down of driveways, parking lots, or other paved surfaces is prohibited;

d) Washing of vehicles is prohibited, except when done by commercial car wash establishments using recycled or reclaimed water

e) Filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes is prohibited;

f) No serving of drinking water by restaurants to patrons except by request;

g) No issuing of new construction meter permits by the City of Banning;

h) Turning off and locking all existing construction meters;

i) Discontinuing all watering and irrigating of commercial nurseries. Those utilizing reclaimed water are exempted from this restriction. Watering of livestock is permitted as necessary.

6.4.5 Implementation

During all stages of a water shortage, the Water Operations Superintendent shall monitor the supply and demand for water on a daily basis to determine the level of conservation required and notify the City Council of the necessity for the implementation or termination of each stage. Each declaration of the Council's implementation or termination of a water conservation stage shall be published at least once in a newspaper of general circulation.

6.5 Penalties

6.5.1 Criminal Penalties

Violation of any mandatory restriction or requirement of City Ordinance 1040 shall constitute a misdemeanor. Conviction of this misdemeanor will result in imprisonment in the county jail for not more than thirty days or a fine of not more than $1,000, or by both such fine and imprisonment.

6.5.2 Civil Penalties

In addition to criminal penalties, violators of the mandatory restrictions shall be subject to civil action initiated by the City.

1) First Violation. For a first violation, the City shall issue a written notice of violation to the water user.

2) Second Violation. For a second violation within a 12-month period, a one-month surcharge of 25% of the previous month's water bill will be imposed.

3) Third Violation. For a third violation within a 12-month period, a one-month penalty surcharge of 50% of the previous month's water bill will be imposed. In addition to the surcharge, the City may install a flow-restricting device at the meter at the expense of the violator.

4) Subsequent Violations. For any subsequent violation within 24 calendar months after a first violation, water service will be discontinued. Service will not be restored until the Water Operations Superintendent has determined that the water user has provided reasonable assurances that future violations will not occur.

6.6 Revenue Impacts

The Water Department's principal source of operating revenue is from water rates. A 50% reduction in water consumption would have a large impact on the Department's revenue. This loss could be in part

offset by penalties collected for violations of mandatory restrictions. Provisions for an emergency reserve were accounted for in the City's current water rates and water service connection fee. At a minimum, this reserve should maintain at a minimum a 60-day operating reserve.

7. WATER DEMAND MANAGEMENT MEASURES

7.1 Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

   A. Water survey programs for single-family residential and multifamily residential customers.

   B. Residential plumbing retrofit.

   C. System water audits, leak detection, and repair.

   D. Metering with commodity rates for all new connections and retrofit of existing connections.

   E. Large landscape conservation programs and incentives.

   F. High-efficiency washing machine rebate programs.

   G. Public information programs.

   H. School education programs.

   I. Conservation programs for commercial, industrial, and institutional accounts.

   J. Wholesale agency programs.

   K. Conservation pricing.

   L. Water conservation coordinator.

   M. Water waste prohibitions.

   N. Residential ultra-low flush toilet replacement programs.

2) A schedule of implementation for all water demand management measures proposed or described in the plan.

3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

4) An estimate, if available, of existing conservation savings on water use within the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, which offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

2) Include a cost-benefit analysis, identifying total benefits and total costs.

3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to the council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California" dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

7.2 Water Demand Management Measures

The City of Banning is committed to implementing water conservation and recycling programs. The City is not currently a signatory to the Memorandum of Understanding (MOU). However, the City has implemented nine of the fourteen Best Management Practices (BMPs) outlined in the MOU.

7.3 BMP 1 – Water Surveys Programs for Single-Family Residential and Multi-Family Residential Customers

This BMP consists of developing and implementing a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers. For each reporting period, direct contact via letter or telephone shall be made to not less than 20% of single-family residential customers and 20% of multi-family residential customers. Water use surveys shall address indoor and outdoor components and contain, at a minimum, the following elements:

- Check for leaks, including toilets, and faucets, and check meters.
- Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, as necessary.

- Check toilet flow rates and offer to install or recommend the installation of a displacement device or direct the customer to an Ultra-Low Flush Toilet (ULFT) replacement program, as necessary; replace leaking toilet flapper, as necessary.
- Check irrigation system and timers.
- Review or develop customer irrigation schedule.
- Measure currently landscaped area (recommended).
- Measure total irrigable area (recommended).

7.3.1 Implementation or Scheduled Implementation

It is recommended that the City of Banning commence implementing this BMP in 2006. The City shall develop and implement a strategy for targeting and marketing water use surveys to single-family and multi-family residential customers by the end of the first reporting period following the date that the implementation was set to commence. The program shall continue until water surveys have been completed for 15% of single-family residential customers and 15% of multi-family residential customers.

7.3.2 Methods to Evaluate Effectiveness

This BMP shall be considered effective if water surveys have been completed for 15% of single-family residential customers and 15% of multi-family residential customers within ten years. California Urban Water Conservation Council (CUWCC) estimates the potential water savings for homes constructed prior to 1980 are 9 gallons per capita per day (gcd) and 3.4 gcd for homes constructed post 1980. In both situations, outdoor use reductions are estimated to be 10%.

7.4 BMP 2 – Residential Plumbing Retrofit

This BMP consists of developing a targeting and marketing strategy to distribute or directly install high-quality, low-flow showerheads (rated 2.5 gpm or less), toilet displacement devices (as needed), toilet flappers (as needed), and faucet aerators (rated 2.2 gpm or less), where required, to single-family and multi-family residences constructed prior to 1992. No less than 10% of single-family connections and multi-family units shall receive and install retrofit kits each reporting period. This BMP shall be implemented until 75% of single-family residences and multi-family units are fitted with high-quality, low-flow showerheads. The number and type of retrofits completed, devices distributed, and program costs shall be tracked.

7.4.1 Implementation or Scheduled Implementation

The City has recently started a program to distribute low-flow showerheads to its residential customers. Starting January 15, 2005, approximately 200 units were available to the public at the Public Works customer service counter. The City also has plans to sponsor a rebate program for the replacement of conventional toilets with ULFTs.

7.4.2 Methods to Evaluate Effectiveness

The effectiveness of low-flow showerheads and ULFTs has been well established. CUWCC estimates the water savings to homes constructed prior to 1980 to be 8.5 gcd and 2.9 gcd to homes constructed after 1980.

7.5 BMP 3 – System Water Audits, Leaks Detection and Repair

The implementation of this BMP shall consist of the following actions:

a) Annually complete a prescreening system audit to determine the need for a full-scale system audit. The prescreening system audit shall be calculated as follows:

   i) Determine metered sales;

   ii) Determine other system verifiable uses;

   iii) Determine total supply into the system;

   iv) Divide metered sales plus other verifiable uses by total supply into the system. If this quantity is less than 0.9, a full-scale audit is indicated.

b) When indicated, agencies shall complete water audits of their distribution systems using methodology consistent with that described in AWWA's *Water Audit and Leak Detection Guidebook*.

c) The City shall advise customers whenever it appears possible that leaks exist on the customer's side of the meter; perform distribution system leak detection when warranted and cost-effective; and repair leaks when found.

7.5.1 Implementation or Scheduled Implementation

The City is in compliance with this BMP through its normal operations. The City maintains records of metered sales, other system uses, and total production. From these records, system water losses are approximately 8 to 10 percent of total water produced. The City currently repairs major leaks to the distribution system as soon as possible; and, under the Capital Improvement Plan, old leaking pipes are continually being replaced.

7.5.2 Methods to Evaluate Effectiveness

The City reviews records to confirm system water losses do not exceed 10 percent. System losses are expected to decrease due to improvements to the distribution system under the Capital Improvement Plan.

7.6 BMP 4 – Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

The implementation of this BMP shall consist of the following actions:

a) Require meters for all new connections and billing by volume of use.

b) Establish a program for retrofitting existing unmetered connections and billing by volume of use.

c) Identifying intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters, and conducting a feasibility study to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.

7.6.1 Implementation or Scheduled Implementation

The City is fully metered for all customer sectors, including meters for single-family residential, commercial, industrial, and all public facilities and will continue to meter all new connections. The City has investigated the feasibility of separately metering all of the multi-family dwelling units in the service area and has determined that it isn't feasible. The City shall investigate the feasibility of installing dedicated landscape meters to the commercial, industrial, and institutional (CII) customers that currently receive water via mixed-use meters.

7.7 BMP 5 – Large Landscape Conservation Programs and Incentives

This BMP shall be implemented by providing support and incentives to non-residential customers to improve landscape water use efficiency, developing ETo-based water use budgets for 90 percent of accounts with dedicated irrigation meters, and provide billing cycle notices of the relationship between the budget and actual consumption. The City must develop and implement a water use survey program for CII accounts with mixed-use meters, directly contact and offer surveys to no less than 20% of CII accounts each reporting period, actively market landscape surveys to unmetered service areas with large landscapes or inefficient water use, and offer the following measures when cost effective:

- Landscape water use analysis/surveys.
- Voluntary water use budgets.
- Installation of dedicated landscape meters.
- Training (multi-lingual where appropriate) in landscape maintenance, irrigation system maintenance, and irrigation system design.
- Financial incentives to improve irrigation system efficiency such as loans, rebates, and grants for the purchase and/or installation of water efficient irrigation systems.
- Follow-up water use analyses/surveys consisting of a letter, phone call, or site visit where appropriate.

Survey elements will include: measurement of landscape area; measurement of total irrigable area; irrigation system check, and distribution uniformity analysis; review or develop irrigation schedules, as appropriate; provision of a customer survey report and information packet. The number of surveys offered, the survey findings, the devices installed, the potential water savings, and the survey costs shall be tracked. Information on climate-appropriate landscape design and efficient irrigation equipment/management shall be provided to new customers and change-of-service customer accounts.

7.7.1 Implementation or Scheduled Implementation

In 1992, the City Council approved City Ordinance No.1012, adding xeriscape requirements to the City Code (City Code 31-8). These requirements apply to all new development, rehabilitated landscaping for CII accounts, schools, parks, and golf courses. This ordinance specifies turf limitations, drought-resistant plant requirements for non-turf areas, irrigation efficiencies, and the submittal of landscape plans to be checked for compliance with xeriscape requirements. A copy of City Ordinance No. 1012 and City Code 31-8 are included in Appendix D.

7.7.2 Methods to Evaluate Effectiveness

The evaluation of landscape plans by the community development director will ensure xeriscape requirements are being implemented. The requirements established in City Ordinance No. 1012 are known to conserve water.

7.7.3 Estimate of Existing Conservation Savings

The City has not yet evaluated the conservation savings from this program.

7.8 BMP 6 – High-Efficiency Washing Machine Rebate Programs

This BMP shall be implemented by offering customers a financial incentive, if cost effective, for the purchase of high-efficiency clothes washing machines (HEWs) that meet a water factor of 9.5 or less. Any financial incentive offered shall not be less than the marginal benefits of the water savings reduced by the necessary expense of administering the incentive program. Incentive levels shall be calculated by using methods found in *A Guide to Customer Incentives for Water Conservation* prepared by Barakat and Chamberlain for the CUWA, CUWCC, and US EPA, February 1994. The City is not required to implement a financial incentive program if the maximum cost-effective rebate is less than $50.

7.8.1 Implementation or Scheduled Implementation

The CUWCC shall begin to review this BMP before July 1, 2005. This review shall determine appropriate agency implementation activities after 2007. The purpose of this review is to revise this BMP to account for potential Federal and State standards, the market share of HEWs with various water factors, further advances in washer efficiency, funding partner activities, and consumer participation.

Once the CUWCC has completed its review, the City shall evaluate the feasibility of implementing this BMP.

7.9 BMP 7 – Public Information Programs

Implementation methods shall at least consist of implementing a public information program promoting water conservation and water conservation related benefits. The program should include, but is not limited to, providing speakers to employees, community groups, and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills showing use in gallons per day for the last billing period compared to the same period the year before; providing public information to promote water conservation practices; and coordinating with other government agencies, industry groups, public interest groups, and the media.

7.9.1 Implementation or Scheduled Implementation

The City has initiated several water conservation programs to educate its utility customers in regards to various approaches to conserve water. At City Hall water conservation information/pamphlets are displayed year round. Public Works employees visit school classrooms and make presentations on water conservation and distribute brochures with additional conservation information. The superintendent of Public Works is in continuous contact with the staff at the Sun Lake Golf Course to manage water more efficiently. The City will continue to educate the public on water conservation.

7.10 BMP-8 – School Education Programs

Implementation methods shall consist of implementing a school education program to promote water conservation and water conservation related benefits. Programs shall include working with school districts and private schools in the water suppliers' service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Education materials shall meet the state education framework requirements and grade appropriate materials shall be distributed to grade levels K-3, 4-6, 7-8, and high school.

7.10.1 Implementation or Scheduled Implementation

The City has a program where Public Works employees visit local schools and make presentations on water conditions in the San Gorgonio Pass area and the value of water and water conservation. Educational brochures are also made available to the students. The City plans to encourage more student involvement and awareness by offering scholarships to the winners of water related contests.

7.11 BMP 9 – Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts

This BMP shall be implemented by identifying and ranking CII accounts according to water use and implementing a program to accelerate the replacement of existing high-water-using toilets with ultra-low-flush (1.6 gallons or less) toilets in CII facilities. In addition, the agency shall either implement a CII water use survey and customer incentive program or achieve water use reductions in the CII sector equaling or exceeding the targets described below. The target water reduction for the CII sector is 10% of baseline use. The agency shall contact and offer, on a repeating basis, water use surveys and customer incentives to at least 10% of the CII customers directly (by mail, telephone or personal visit). Water use surveys must include a site visit, an evaluation of all water-using apparatuses and processes, and a customer report identifying recommended efficiency measures, their expected payback period, and available agency incentives. Within one year of a completed survey, the agency shall follow-up with a phone call or site visit in regards to customer facility water use and water saving improvements. The agency shall track customer contacts, accounts receiving surveys, follow-ups, and measures implemented. The coverage for this BMP is to audit 10% of the total CII accounts or reduce annual water use by CII accounts by 10% of the annual baseline water use within 10 years of the date implementation is to commence.

7.11.1 Implementation or Scheduled Implementation

The City will begin implementing this BMP in 2006.

7.11.2 Methods to Evaluate Effectiveness

The CII sector used an average of 2,225 acre-ft of water during the period of 2000 to 2004. This value will be used as the baseline for estimating water savings. This BMP shall be considered effective if within ten years of implementation the CII annual water use has been reduced by 10%, or 10% of CII accounts accept a water use survey, or the CII ULFT program results in a 3% water savings of the Total Water Savings Potential as defined by Exhibit 8 of the MOU.

7.12 BMP 10– Wholesale Agency Assistance Programs

This BMP shall be implemented by wholesale water suppliers. Wholesale water suppliers shall provide financial incentives, or equivalent resources, as appropriate, beneficial, and mutually agreeable to their retail water agency customers to advance water conservation efforts and effectiveness. All BMPs implemented by retail water agency customers that can be shown to be cost-effective in terms of avoided cost of water from the wholesaler's perspective, using CUWCC cost-effectiveness analysis procedures, will be supported.

The wholesale water agencies shall provide conservation-related technical support and information to all retail agencies that they serve as a wholesale supplier. At a minimum this requires:

- Conducting, funding, and/or promoting workshops that address the following topics:

  a) CUWCC procedures for calculating program savings, costs, and cost-effectiveness;

  b) Retail agencies' BMP implementation reporting requirements; and

  c) The technical, programmatic, strategic, and/or other pertinent issues and developments associated with water conservation activities in each of the following areas: ULFT replacement, residential retrofits, commercial, industrial and institutional surveys, residential and large turf irrigation, and conservation-related rates and pricing.

- Having the necessary staff or equivalent resources available to respond to retail agencies' technical and programmatic questions involving the CUWCC's BMPs and their associated reporting requirements.

When mutually agreeable and beneficial, the wholesaler may enforce all or any part of the conservation-related activities that a given retail supplier is obligated to implement under the BMP's cost-effectiveness test.

Wholesale agencies shall work in cooperation with their customers to identify and remove potential disincentives to long-term conservation created by water shortage allocation policies; and to identify opportunities to encourage and reward cost-effective investments in long-term conservation shown to advance regional water supply reliability and sufficiency.

7.12.1 Implementation or Scheduled Implementation

The City is not a wholesale water supplier and, therefore, does not offer financial incentives to retail water agencies to advance water conservation efforts.

7.13 BMP 11 – Conservation Pricing

Implementation methods shall be at least as effective as eliminating non-conservation pricing and adopting conservation pricing. This BMP applies to the pricing of both water and sewer services. Suppliers that supply water but not sewer service shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer services.

Non-conservation pricing provides no incentives for customers to reduce use. Such pricing is characterized by one or more of the following components:

a) Rates in which the unit price decreases as the quantity used increases (declining block rates);

b) Rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used;

c) Pricing in which the typical bill is determined by high fixed charges and low commodity charges.

Conservation pricing provides incentives for customers to reduce average or peak use, or both. Rates should be designed to recover the cost of providing service and billing for water and sewer service should be based on metered water use. Such pricing is characterized by one or more of the following components:

a) Rates in which the unit rate is constant regardless or the quantity used (uniform rate);

b) Rates in which the unit rate increases as the quantity used increases (increasing block rates);

c) Seasonal rates or excess-use surcharges to reduce peak demand during summer months;

d) Rates based upon the long-run marginal cost or the cost of adding the next unit of capacity to the system.

7.13.1 Implementation or Scheduled Implementation

The City is in compliance with this BMP. The City has a three-block increasing rate structure that applies to all customers. The City's sewer service is based on EDUs. The City defines one EDU as 225 gallons per day. Rates vary per customer type based on an assigned fraction of an EDU. The City does not intend to reestablish the fee for sewer service based on water use.

7.13.2 Methods to Evaluate Effectiveness

The effectiveness of this BMP can be evaluated by reviewing bill records and pricing structure.

7.14 BMP 12 – Conservation Coordinator

The implementation of this BMP shall consist of at least the following actions:

a) Designation of a water conservation coordinator, and support staff if necessary, whose duties shall include the following:

   i) Coordination and oversight of conservation programs and BMP implementation;

   ii) Preparation and submittal of the CUWCC BMP Implementation Report (for signatories to the MOU);

   iii) Communication and promotion of water conservation issues to agency senior management, coordination of agency conservation programs with operations and planning staff, preparation of annual conservation budget, and preparation of the conservation elements of the agency's Urban Water Management Plan.

b) Agencies that are jointly operating regional conservation programs are not expected to staff duplicative and redundant conservation coordinator positions.

7.14.1 Implementation or Scheduled Implementation

The City's Superintendent of Public Works serves as a part-time water conservation coordinator. If the need arises, the City will hire a full-time water conservation coordinator.

7.15 BMP 13 – Water Waste Prohibition

Implementation methods shall be enacted and enforced that prohibit gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

Agencies shall support the efforts to develop state law regarding exchange-type water softeners that would:

1) Allow the sale of only more efficient, demand-initiated regenerating (DIR) models;

2) Develop minimum appliance efficiency standards that increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used and implement an identified maximum number of gallons discharged per gallon of soft water produced;

3) Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.

Agencies shall also include water softener checks in home water audit programs and include information about DIR and exchange-type water softeners in their educational efforts to encourage replacement of less efficient timer models.

7.15.1 Implementation or Scheduled Implementation

In 1991, City Ordinance No. 1039 was passed by the City Council, prohibiting the waste of water. This Ordinance and City Code 31-7 describe the actions that are considered to waste water and the subsequent penalties if a violation were to occur. In 1998, this Ordinance was incorporated into City Ordinance No. 1231. A copy of City Ordinance No. 1231 and City Code 31-7 are included in Appendix D.

7.16 BMP 14 – Residential Ultra-Low-Flush Toilets (ULFT) Replacement Programs

Implementation of this BMP shall consist of at least the following actions:

a) Implementation of programs for replacing existing high-water-using toilets with ultra-low-flush (1.6 gallons or less) toilets in single-family and multi-family residences;

b) Programs shall be at least as effective as requiring toilet replacement at time of resale.

7.16.1 Implementation or Scheduled Implementation

The City plans to sponsor a rebate program to replace conventional toilets with ULFTs. The City is also considering passing a City Ordinance that requires ULFT retrofits at the time of resale of all residential units.

8. WATER RECYCLING

8.1 Law

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

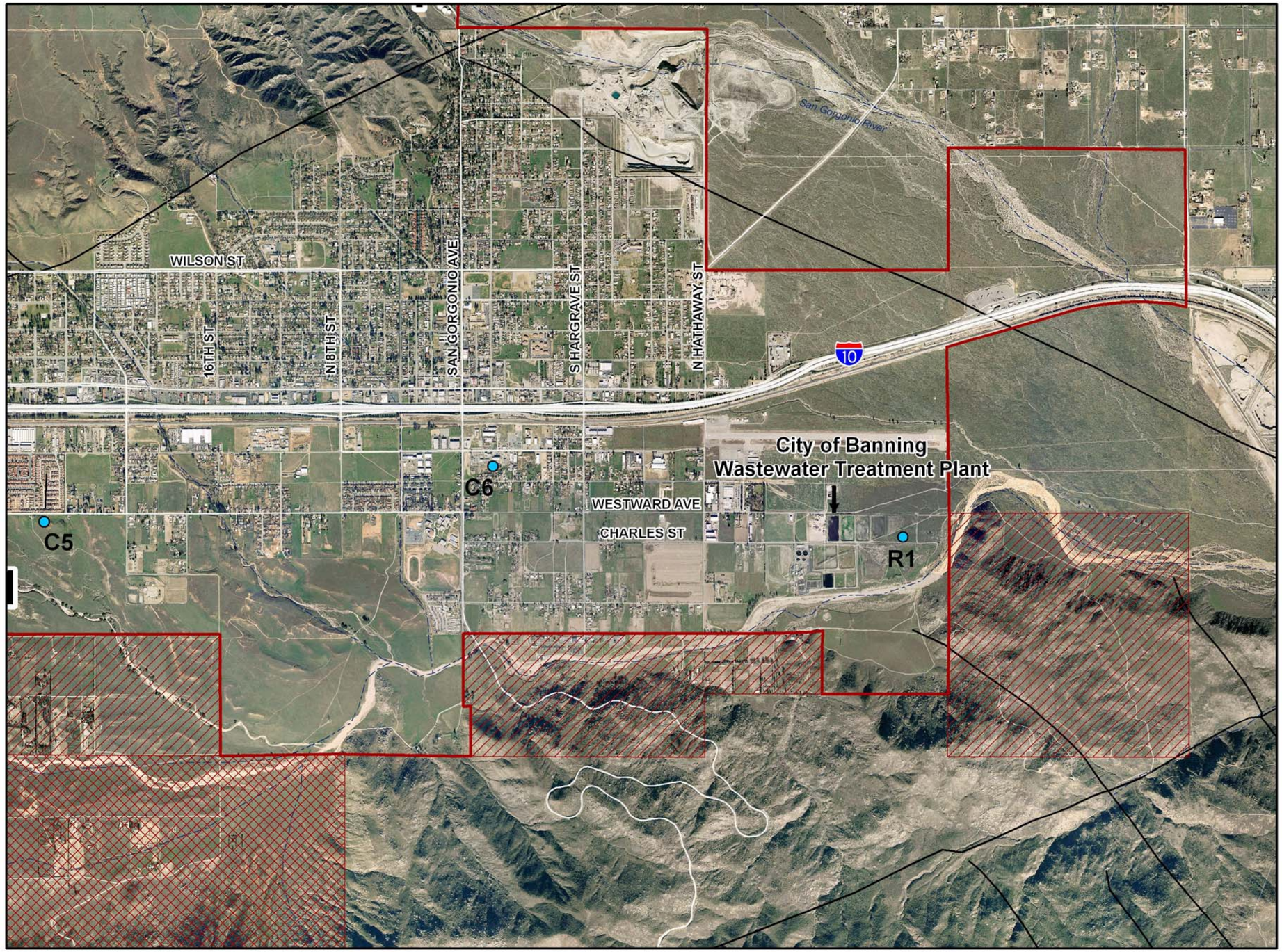
(e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

8.2 Wastewater Collection, Treatment, and Disposal

The City of Banning Wastewater Treatment Plant is located in the southeast section of the City and is shown in Figure 8-1. The plant is operated and maintained by United Waters Service. Recent upgrades have resulted in an increase of secondary treatment capacity to 3.6 mgd. The headworks, completed in 1999, was designed for an ultimate capacity of 7.8 mgd. As of January 2005, the plant receives an average flow of approximately 2.3 to 2.4 mgd.

Sewer services are provided to the entire city limits and to the unincorporated areas of Riverside County that surround the southeast section of the City. Collected wastewater is transported by sewer main lines that are 8, 10, 15, and 18 inches in diameter, which are connected to trunk lines. The trunk lines, ranging from 24 to 30 inches in diameter, convey wastewater to the plant. Wastewater received by the plant undergoes treatment consisting of screening, grit removal, primary clarification, trickling filters, and secondary clarifiers. Anaerobic digesters and sludge drying beds are used for sludge stabilization and



Main Features

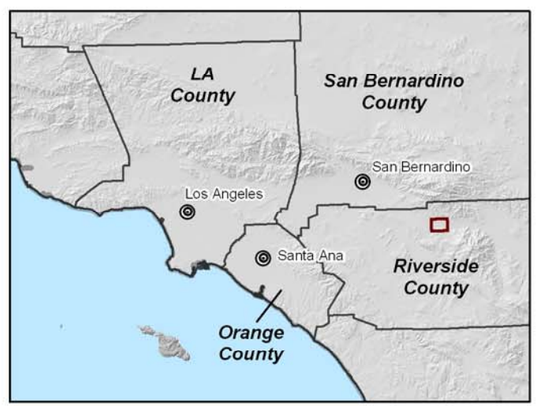
- Groundwater Production Well
- Banning City Boundary
- City of Banning Sphere of Influence
- City of Banning Planning Area

Other Features

Faults & Groundwater Divides

- Location Certain
- Location Approximate
- Location Concealed
- Location Uncertain
- Groundwater Divide

River



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2005 Urban Water Management Plan

City of Banning
Wastewater Treatment Plant

Figure 8-1

dewatering. Treated effluent is then discharged to percolation ponds and subsequently recharges the East Banning storage unit.

8.3 Recycled Water Use

8.3.1 Current Recycled Water Use

Presently, treated wastewater is not being used to offset potable water demands. However, the demand for recycled water is already present and is expected to increase over time. The City has commissioned several studies to determine the infrastructural and economical requirements to proceed with a recycled water program.

8.3.2 Potential for Recycled Water Use

There is considerable potential for the use of recycled water in the City of Banning. The City has plans to use recycled water for the irrigation of golf courses, parks, medians and greenbelts. Recycled water will also be made available for irrigating the landscapes of new homes. A summary of the wastewater effluent quality currently being discharged is presented in Table 8-1. Although, in order to provide recycled water for irrigation, the Wastewater Treatment plant would have to be upgraded to meet Title 22 tertiary standards. This would require activated sludge, microfiltration, and disinfection.

The feasibility of upgrading the current wastewater treatment plant was investigated in *Irrigation Water Feasibility Study* (Montgomery Watson Harza, 2003). Two possible solutions were proposed. One, the trickling filter could be replaced by an activated sludge basin. This option may also require replacing the secondary clarifiers. The second option is to construct a parallel sludge treatment process. This process would utilize the existing headworks, which was designed to feed a parallel 4.2 mgd plant. During construction, the existing plant could be used to treat wastewater not needed for recycled water use.

The Montgomery Watson Harza report outlined a rate structure to finance the wastewater treatment plant upgrade or replacement. Their recommended rate increase was approved by the City Council on August 7, 2003 (Banning City Code Section 31-5.1). Additionally, an increase in the sewer system connection fee to $2,786 was approved on December 14th, 2004 (Ordinance No. 1321). A copy of the City Code and Ordinance can be found in Appendix D.

Table 8-1
Average Wastewater Effluent Quality for 2000-2004

Chemical	Units	Average
Aluminum	mg/L	0.38
BOD	mg/L	24
Chloride	mg/L	49
Fluoride	mg/L	0.77
Iron	mg/L	0.16
Nitrate	mg/L	12
pH	units	7.8
Sulfate	mg/L	33
TDS	mg/L	420
Total Nitrogen	mg/L	21
TSS	mg/L	19

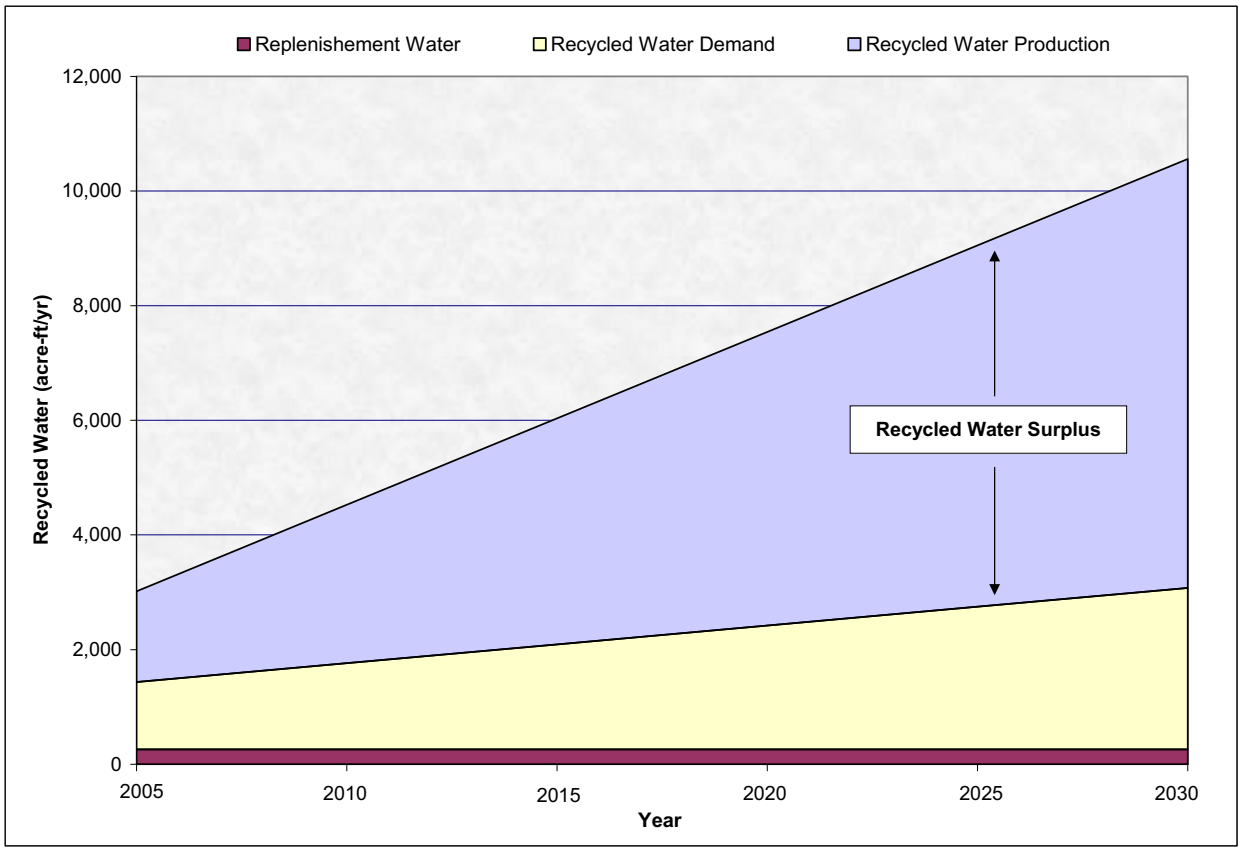
8.3.3 Projected Use of Recycled Water

Recycled water can be used to meet future irrigation demand and, subsequently, offset a portion of potable water demand. Figure 8-2 shows projected recycled water production and demand through the year 2030. Because Banning's wastewater treatment plant overlies the East Banning storage unit, recycled water can be used for replenishment or to supplement the safe yield. A recent order issued by the RWQCB (R8-2005-0033) states that the recycled water contribution can not exceed 20% of total water recharged, based on a 60-month running average, in recycled water groundwater recharge programs. In the East Banning storage unit, the recycled water contribution would be 260 acre-ft/yr, based on a safe yield of 1,050 acre-ft/yr.

In Figure 8-2, recycled water production is a fraction of total water demand and projected from known values in 2003. Indoor water use is typically one-half of residential water demand and, therefore, recycled water production would be approximately one-half as well. This percentage was assumed for total water demand.

As shown in Figure 8-2, recycled water production is about twice the demand in 2005 and continues to increase at a much higher rate than recycled water demand. By 2030, the City is estimated to have approximately 7,500 acre-ft/yr of surplus recycled water.

Figure 8-2
Projected Recycled Water Production and Demand



8.3.4 Incentives for Recycled Water Use

The City's Water Shortage Contingency Plan has exceptions from water conservation measures for consumers, such as golf courses, commercial nurseries, and car wash facilities, who use recycled water. The City can encourage recycled water use by restructuring its water rates and service charges for customers that use recycled water.

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